

# MINUTES OF THE PROCEEDINGS



OF THE

## METEOROLOGICAL COUNCIL,

1892—1893.



LONDON:

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1894.



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Office

MINUTES OF THE PROCEEDINGS  
OF THE  
METEOROLOGICAL COUNCIL.

1892—93.

63, Victoria Street, April 6, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (March 23) were read and confirmed.

Reported—That the transfer of the observatory from Valencia Island to Westwood House had been completed, the telephone erected, and the messages regularly received from Cahirciveen from the 28th ultimo.

Read—Letters 637 and 677 from Messrs. Few, enclosing copies of the lease of Westwood House from Trinity College to Captain Needham, and of the sale of that lease to the Royal Society. Mr. Scott was instructed to ask Messrs. Few as to the transfer of the lease to the Meteorological Council.

Reported—That a letter (M.O. 653) had been received from the Post Office requesting that the electrical anemometer should be sent to that office (Minutes 1891, p. 83), and that instructions had been sent to Kew Observatory to forward the apparatus accordingly.

Mr. Scott reported that the increase in the allowance to the Scottish Meteorological Society, calculated on the same scale as that to the Royal Meteorological Society (Minutes 1891, p. 68), would be 22*l.* annually; being—

|                                                                  | £ | s. | d.  |
|------------------------------------------------------------------|---|----|-----|
| For 4 stations, 12 detailed sheets, 2 <i>s.</i> 6 <i>d.</i> each | - | 6  | 0 0 |
| For 16 stations, annual sheets, 1 <i>l.</i> each                 | - | 16 | 0 0 |

—This increase was sanctioned.

Reported—That a letter (No. 612) had been received from Mr. C. L. Wragge, Government Meteorologist, Queensland, asking if there would be any chance of employment for him under the Council if he returned to England. Mr. Scott stated that he had replied (P.C. 613) to the effect that there was no present opening.

Read—A letter from Mr. Baillie stating that since last meeting three logs had been received, all of them being “excellent.” Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following report on the 8.30 p.m. forecasts for March 1892 :—

The letters used have the following signification :—

a = complete success.

b = partial (i.e., more than half) success.

c = partial failure.

d = total failure.

MARCH.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success<br>a + b. |
|------------------|---|---------------|----------|----------------------|-------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                     |
| SCOTLAND, N.     | a | 26            | 61       | 44                   | 88                                  |
| "                | b | 65            | 23       | 44                   |                                     |
| "                | c | 3             | 6        | 4                    |                                     |
| "                | d | 6             | 10       | 8                    |                                     |
| SCOTLAND, E.     | a | 58            | 62       | 60                   | 89                                  |
| "                | b | 26            | 32       | 29                   |                                     |
| "                | c | 10            | 3        | 7                    |                                     |
| "                | d | 6             | 3        | 4                    |                                     |
| ENGLAND, N.E.    | a | 45            | 65       | 55                   | 78                                  |
| "                | b | 26            | 19       | 23                   |                                     |
| "                | c | 19            | 10       | 14                   |                                     |
| "                | d | 10            | 6        | 8                    |                                     |
| ENGLAND, E.      | a | 39            | 61       | 50                   | 78                                  |
| "                | b | 32            | 23       | 28                   |                                     |
| "                | c | 16            | 10       | 13                   |                                     |
| "                | d | 13            | 6        | 9                    |                                     |
| MIDLAND COUNTIES | a | 52            | 52       | 52                   | 83                                  |
| "                | b | 29            | 32       | 31                   |                                     |
| "                | c | 13            | 10       | 11                   |                                     |
| "                | d | 6             | 6        | 6                    |                                     |
| ENGLAND, S.      | a | 61            | 58       | 60                   | 90                                  |
| "                | b | 29            | 32       | 30                   |                                     |
| "                | c | 7             | 7        | 7                    |                                     |
| "                | d | 3             | 3        | 3                    |                                     |
| SCOTLAND, W.     | a | 48            | 48       | 48                   | 71                                  |
| "                | b | 23            | 23       | 23                   |                                     |
| "                | c | 23            | 19       | 21                   |                                     |
| "                | d | 6             | 10       | 8                    |                                     |
| ENGLAND, N.W.    | a | 45            | 52       | 49                   | 81                                  |
| "                | b | 29            | 36       | 32                   |                                     |
| "                | c | 20            | 6        | 13                   |                                     |
| "                | d | 6             | 6        | 6                    |                                     |
| ENGLAND, S.W.    | a | 52            | 65       | 59                   | 83                                  |
| "                | b | 26            | 23       | 24                   |                                     |
| "                | c | 16            | 3        | 10                   |                                     |
| "                | d | 6             | 9        | 7                    |                                     |
| IRELAND, N.      | a | 52            | 36       | 44                   | 78                                  |
| "                | b | 26            | 42       | 34                   |                                     |
| "                | c | 19            | 6        | 13                   |                                     |
| "                | d | 3             | 16       | 9                    |                                     |
| IRELAND, S.      | a | 29            | 45       | 37                   | 73                                  |
| "                | b | 39            | 32       | 36                   |                                     |
| "                | c | 23            | 10       | 16                   |                                     |
| "                | d | 9             | 13       | 11                   |                                     |
| SUMMARY.         |   |               |          |                      |                                     |
| BRITISH ISLES    | a | 46            | 55       | 51                   | 81                                  |
| "                | b | 32            | 29       | 30                   |                                     |
| "                | c | 15            | 8        | 12                   |                                     |
| "                | d | 7             | 8        | 7                    |                                     |

**Submitted—The following reports of work during the month of March 1892 :—**

**MARINE BRANCH.**

April 5, 1892.

Examined 11 new logs and 3 lighthouse registers.

Discussion of the meteorology of the district between the Cape of Good Hope and New Zealand. Adding such information as can be obtained from the logs of H.M. ships prior to 1850, and preparing a chart for the month of February showing the wind, barometer, and air temperature results.

The winds for the Red Sea area are being grouped for the respective forces on the method followed for the Southern Ocean district, and the wind-roses for several months have been re-drawn.

From the Public Record Office 501 volumes of men-of-war's logs were received during the month for the discussion of ocean currents.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

**TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.**  
(To 31st March 1892.)

*Weekly Weather Report*, 1891.—All numbers and appendices issued excepting title page and preface, which are awaiting information from Dr. Buchan.

*Weekly Weather Report*, 1892.—All numbers issued to date.

*Daily Weather Report*, 1891.—Quite completed; title-page, preface, &c., published.

" " 1892.—All numbers issued to date. Correction sheet for February also issued.

*Primary Checking of Storm Signals*, 1892.—Done to date.

*Checking of Daily (8.30 p.m.) Forecasts*.—Almost up to date.

*Checking of Hay Harvest Forecasts*, 1891.—Completed; awaiting preparation of report thereon: will be ready in a few days.

*Quarterly Weather Report*, 1881.—In hand.

During this month Mr. Brodie has been away, ill, for about a fortnight.

(Signed) FREDC. GASTER.

6th March 1892.

**PANTAGRAPH ROOM.**

April 1, 1892.

*Hourly Means.*

The whole of the tables for the year 1889 have been completed, and sent to press. Proofs of a portion of the work have been received and revised.

The tables for 1890 have been commenced.

Rather more time than usual has been occupied in connexion with the sunshine returns, the solstice being a favourable time for testing the adjustments of the instruments. Some time has also been spent upon a comparison of the returns from Regent's Park, Bunhill Row, and this Office.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

**EXAMINATION BRANCH.**

April 1, 1892.

*Examinations.*

*January–June 1890.* — Times and values of the daily *maxima* and *minima* atmospheric pressures for all observatories.

*November 1891.*—Completed.

*December 1891.*—Partly.

*January and February 1892.*—Partial examination of the Valencia work for the Registrar-General of Ireland.

Weekly examination (on receipt) of curves and documents from all observatories.

*Reports.*

*October 1891.*—Copies of "Notes of Errors" to all observatories.

On the experiments in connexion with the *marking medium* and *paper* for the self-recording rain-gauge.

*Miscellaneous.*

*Diurnal Range of Rainfall, 1871–1890.*—Correcting Hourly Values.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands during the past four weeks :—

# 1. WARNINGS ISSUED.

## SUMMARY.

A + B (successful) - - - = 16 districts.  
C (failures) - - - = 6 „

# 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

On the night of the 16th March a depression skirted our extreme north-west coasts, and occasioned a strong gale from the south-westward in the north-west of Ireland and the extreme north of Scotland. The baric fall reported at 6 p.m. of the 16th did not appear sufficiently serious to justify the issue of warnings.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
April 6, 1892.

The increments to the “classified” clerks referred to on Minutes, 1884-85, pp. 118-9, were allowed in the following cases :—

|                                                    | Salary in 1891-92. | Proposed for 1892-93. |
|----------------------------------------------------|--------------------|-----------------------|
| CLASS I.—MAXIMUM 275 <i>l</i> .                    |                    |                       |
| J. A. Curtis - - - - -                             | £ s. d.<br>240 0 0 | £ s. d.<br>245 0 0    |
| J. E. Cullum (Minutes, 1886-7, p. 98) - - - - -    | 245 0 0            | 250 0 0               |
| CLASS IV.—MAXIMUM 110 <i>l</i> .                   |                    |                       |
| F. W. Snell (Minutes, 1888-9, p. 107) - - - - -    | 90 0 0             | 95 0 0                |
| C. W. Heinemann (Minutes, 1886-7, p. 98) - - - - - | 80 0 0             | 85 0 0                |
| L. H. Powers ( „ 1887-8, p. 120) - - - - -         | 70 0 0             | 75 0 0                |
| A. H. Bracey ( „ 1890-1, p. 76) - - - - -          | 60 0 0             | 65 0 0                |

The following weekly increments referred to on Minutes 1891-2, p. 7, were allowed :—

|                               | Maximum. | Salary in 1891-92. | Proposed for 1892-93. |
|-------------------------------|----------|--------------------|-----------------------|
|                               | £ s. d.  | £ s. d.            | £ s. d.               |
| Miss M. E. Anderson - - - - - | 1 10 0   | 1 2 0              | 1 4 0                 |
| Miss R. E. Smith - - - - -    | 1 10 0   | 1 0 0              | 1 2 0                 |
| Boys { F. E. Dash - - - - -   | 1 0 0 {  | 0 15 6             | 0 17 0                |
| { H. A. Hewitt - - - - -      |          | 0 15 6             | 0 17 0                |
| { A. H. Brown - - - - -       |          | 0 14 0             | 0 15 6                |
| { A. H. Rigby - - - - -       |          | 0 12 6             | 0 14 0                |

C. E. Goad, messenger, to receive 15*s*. instead of 13*s*. as hitherto. All weekly increments to date from 4th April.

Reported—That the cash accounts for the six months ended the 30th September 1891, had this day been audited by the Chairman and Mr. Stone, and would forthwith be sent to the Treasury for the Audit Office. The receipts for the six months amounted to 7,554*l*. 5*s*. 10*d*. The payments amounted to 7,274*l*. 1*s*. 3*d*., leaving a balance of 3,381*l*. 5*s*. 9*d*. in hand and at the bank on the 1st October 1891, as against 3,101*l*. 1*s*. 2*d*. on the 1st April 1891.

Submitted—The following list of publications which had been received since the last meeting :—

*Mexico, Observatorio Meteorológico Central.*—Anales del Ministerio de Fomento. Tomo ix.

*Rugby School Natural History Society.*—Report for the year 1891.

*Assmann, R.*—Gebrauchsanweisung für das Assmannsche Aspirationspsychrometer.

*Augustin, F.*—Über die Schwankungen des Wasserstandes der Moldau.

*Herrmann, E.*—Die stürmischen Winde an der Deutschen Küste in den Jahren 1878–87. Anhang. Die stürmischen Winde auf Adlergrund im Vergleich zu denen an einigen Stationen der Deutschen Ostseeküste.

*Christiania, Norwegisches Meteorologisches Institut.*—Jahrbuch für 1890.

*Mill, H. R.*—The Clyde sea area.

*Washington, United States Naval Observatory.*—Observations made during the year 1887.

*Rizzo, G. B.*—Osservazioni meteorologiche fatte nell' anno 1890 all' Osservatorio della R. Università di Torino.

— Di un notevole tipo isobarico subalpino.

*Madrid, Observatorio.*—Resumen de las observaciones meteorológicas efectuadas en la Peninsula y algunas de sus islas adyacentes durante el año de 1889.

*Rotch, A. L.*—The International Meteorological Conference at Munich.

*Hann, J.*—Einige Resultate stündlicher meteorologischer Beobachtungen auf dem Gipfel des Fuji in Japan.

*Hamburg, Deutsche Seewarte.*—Ergebnisse der meteorologischen Beobachtungen im Systeme der Deutschen Seewarte für das Lustrum 1886–90.

— — — Deutsches meteorologisches Jahrbuch für 1890. Beobachtungs System der Deutschen Seewarte. Jahrg. xiii.

*Laschober, F. und Kesslitz, W.*—Magnetische Beobachtungen an den Küsten der Adria in den Jahren 1889 und 1890.

*Leyst, E.*—Über die Berechnung von Temperatur-Mitteln aus Beobachtungen zu den Terminen 8 Uhr Vm., 2 Uhr und 8 Uhr Nm.

*Vincent, J.*—Contrôle des abris thermométriques de l'observatoire d'Uccle.

*Kiel, Kommission zur wissenschaftlichen Untersuchung der deutschen Meere.*—Atlas deutscher Meeresalgen. i–ii, Heft.

63, Victoria Street, April 20, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.

|

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 6) were read and confirmed.

Mr. Scott reported that he had called on Mr. Few on the 7th instant, relative to the transfer of the lease of Westwood House to the Council, and he submitted a letter (No. 737) from that gentleman, which explained that under the Act of 1862 such an Association as the Council could not, without the special sanction of the Board of Trade, hold more than two acres of land.

Submitted—The following report :—

REPORT of VISIT to NEW OBSERVATORY at WESTWOOD HOUSE, CAHIRCIVEEN, in MARCH 1892,  
by G. M. WHIPPLE.

I ARRIVED on the evening of Saturday, March 5th.

On Monday Mr. Galvin came to the Observatory accompanied by his workmen. We arranged for the closing in by a brick and slate erection of the instrument room on the ground floor, so that the thermograph should be on the ground level, and its thermometer bulbs should be fitted at a height of 5 feet above it. The mason accordingly prepared foundations for the erection of a wall arranged so as to form an alcove, which enclosed the thermograph slab and formed the north wall to the instrument room. Mr. Cullum and I then proceeded to Valencia, and dismounted the anemograph there, which we shipped on board a boat and conveyed direct to Westwood. The same evening we landed it and stowed it in the Westwood boathouse for the night.

The next morning we carted it up to the Observatory House, where we erected it upon the roof, making use of the same sheet-lead that we had brought from Valencia, as we were unable to procure suitable new material at Cahirciveen. We then found some difficulty in joining up the shafts, for the new sections provided by Munro did not fit the old ones in any way. However, after some consideration and trouble I jointed up all the lengths by means of well-pinned mahogany plugs, excepting one joint which could not be made in that way, but which was carefully soldered up by Mr. Windeler, at the Telegraph Station, who kindly rendered me that service when I took the length to him. The next day we were able, after having cleaned the instrument thoroughly in every part and approximately oriented it, to set it in action, having lost only three days' record during the transfer from the Old Observatory.

On Thursday we went again to Valencia, having a very rough and tedious transit across the ferry. We dismounted the thermograph and the standard thermometers, which we then conveyed to Westwood. The anemograph was properly oriented by means of the sun, and again started on Friday at 11 a.m. Then on Saturday we erected the thermograph slab, and properly covered in the instrument room. On Monday we fitted up the thermograph screen and cleaned the metal fittings, the lenses, and clock of thermograph. Tuesday, the 15th, the barograph and Stokes's sunshine recorder were dismounted at Valencia, and removed to the New Observatory, a proper brick pillar 5 feet high having been built to support the recorder in the meadow to the north of the house, but sufficiently distant as not to be shadowed at any time. On the 18th the barograph clock was cleaned, and the instrument was partly erected. The Beckley rain-gauge was planted over the site which had been prepared for it by excavating a hole and draining it, and fixing a levelled slate slab to support it.

On Saturday, March 19th, all the instruments were started provisionally, and on Monday, 21st, observations were made to adjust the sunshine recorder and to fix it in its place. The next day we dismounted and brought the standard barometer to Westwood, where we fixed it properly and adjusted it the next day, having referred its position to a bench-mark we had discovered on the wall of a cottage about half a mile distant to the south-east.

With the view of determining the exposure of the sunshine recorder, which is not altogether satisfactory, I made the following readings of the height of the visible horizon all round the pillar upon which the instrument is placed.

| Bearing.   |   |   | Height of Ground. | Bearing.     |   |   | Height of Ground. |
|------------|---|---|-------------------|--------------|---|---|-------------------|
| Mag. North | - | - | + 1°30            | 190° House   | - | - | +15°30            |
| 10° E.     | - | - | + 3               | 200° House   | - | - | +13               |
| 20° E.     | - | - | + 4               | 210° House   | - | - | +14               |
| 30° E.     | - | - | + 5               | 220° House   | - | - | +13               |
| 40° E.     | - | - | + 5               | 230°         | - | - | + 5               |
| 50° E.     | - | - | + 4               | 240°         | - | - | + 2               |
| 60° E.     | - | - | + 6               | 250°         | - | - | + 1               |
| 70° E.     | - | - | + 3               | 260°         | - | - | + 1               |
| 80° E.     | - | - | + 1°30            | 270° from N. | - | - | + 1°30            |
| 90° E.     | - | - | + 2               | 275°         | - | - | + 2°30            |
| 100°       | - | - | + 5               | 280°         | - | - | + 1               |
| 110°       | - | - | + 8               | 290°         | - | - | + 1               |
| 120°       | - | - | + 8°30            | 300°         | - | - | + 0°30            |
| 130°       | - | - | +10               | 310°         | - | - | + 2°0             |
| 140°       | - | - | + 9               | 320°         | - | - | + 4               |
| 150°       | - | - | + 7°30            | 330°         | - | - | + 2               |
| 160°       | - | - | + 7°30            | 340°         | - | - | + 2               |
| 170°       | - | - | + 6°30            | 350°         | - | - | + 1               |
| 183° Tower | - | - | +19               |              |   |   |                   |

On March 24th I compared the thermometers with the Kew Standard No. 399, and found readings as follows:—

| —              |     |   |                                         | —    | Correction. |
|----------------|-----|---|-----------------------------------------|------|-------------|
| Kew Standard - |     |   |                                         | 43°6 | —           |
| Dry            | do. | - | -                                       | 44°0 | — 0°4       |
| Wet            | do. | - | - <i>K.S. 4773 - (Same No. 0. 6799)</i> | 43°8 | — 0°2       |
| Max., No. 1003 |     |   |                                         | 43°6 | 0°0         |
| Min., No. 2497 |     |   |                                         | 43°6 | 0°0         |

I then left Westwood, all instruments working well excepting the light stop in the case of the barograph.

On March 26th I visited the Mountjoy Observatory, where I dismounted and cleaned the anemometer and freshly oiled the bearings and clock.

March 29th and 30th I visited the Armagh Observatory, where the anemograph was not working. With the assistance of two workmen I was able to take down the instrument, and, having built a fire round it and well heated the congealed oil, we were able to thoroughly clean it and afterwards to put it together and start it afresh, well-oiled and cleaned, leaving the bearings in perfect order. I also examined and oiled the Beckley rain-gauge, which I found to be in most excellent order.

I examined the anemograph at Holyhead, and found it in good order, with the exception of the arms and stays supporting the cups. These are very much corroded, due to the action of both smoke and spray, and will soon require to be replaced by new ones. The direction-fans are also considerably worn, but will last for some years longer. The new attendant in charge of the anemograph appears an active and intelligent young man. His name is William Davies.

P.S.—A new sheet of india-rubber packing is required for the door of the Mountjoy anemograph. It is  $\frac{3}{16}$ ths of an inch thick,  $16\frac{3}{4}$  inches long by  $16\frac{1}{4}$  inches wide, cut out like a picture-frame,  $15\frac{3}{4}$  inches long by  $15\frac{1}{4}$  inches wide.

(Signed) G. M. WHIPPLE.

April 1892.

The draft of the Report of the Office for the year 1891–2 was submitted.

Read—Letters 736 and 776 from Professor Grant, of Glasgow, stating that the thermometers at the observatory had been maliciously broken on the night of the 9th instant, and requesting that others may be sent.

Mr. Scott was instructed to reply (P.C. 764) that if there is no fund to defray the cost of new thermometers, the Council would supply them gratis, the arrangements for their erection to be the same as on the former occasion (Minutes, 1885, p. 42).

Read—A memorandum from Mr. Baillie, stating that since last meeting two logs had been received, one being “excellent.”  
Mr. Scott was instructed to convey the marked thanks of the Council to the observer.

Submitted—The following return :—

Since the last meeting of the Council there have been no warnings issued, nor any gales experienced on the coasts of the British Islands.

Telegraphic Branch,  
April 20, 1892.

(Signed)      FREDC. GASTER.

Submitted—The following report :—

HAY HARVEST FORECASTS.

Meteorological Office, Telegraph Branch,  
April 13, 1892.

SIR,

I BEG to submit, herewith, the results of the checking of the Hay Harvest Forecasts during the hay-making period of 1891.

The telegrams were sent daily between 3.30 p.m. and 4 p.m. on each week-day for about five weeks, beginning over the Southern districts of England on the 15th June, and ending in those regions on the 18th July. The commencement and ending occurred about a fortnight later in most other parts of the country.

Notwithstanding the very unsettled conditions which prevailed during the summer months of last year, the general per-centage of success has again reached 89, being the same degree of success which was recorded in the two preceding years 1889 and 1890. The largest general per-centage (94) was reached in England, N.W., while the smallest (82) was in Scotland, N. In addition to the recipients named in the list, telegrams were sent to six other gentlemen at their own cost.

In Table II. will be found remarks by several other of the recipients, speaking very favourably of the forecasts.

I am, &c.  
(Signed)      FREDC. GASTER.

R. H. Scott, Esq., M.A., F.R.S.,  
Secretary, Meteorological Council.

TABLE I.—SUMMARY of RESULTS.

| Districts.       | Names of Stations.                             | Per-centages.     |                  |                  |                | Total Per-centage or Success. |
|------------------|------------------------------------------------|-------------------|------------------|------------------|----------------|-------------------------------|
|                  |                                                | Complete Success. | Partial Success. | Partial Failure. | Total Failure. |                               |
| SCOTLAND, N. -   | Munlochy and Golspie -                         | 40                | 42               | 17               | 1              | 82                            |
| SCOTLAND, E. -   | Aberfeldy, Glamis, and Rothiemay               | 49                | 41               | 9                | 1              | 90                            |
| ENGLAND, N.E.    | Chatton and Ulceby -                           | 61                | 26               | 11               | 2              | 87                            |
| ENGLAND, E. -    | Rothamsted and Thorpe -                        | 69                | 23               | 8                | —              | 92                            |
| MIDLAND COUNTIES | Cirencester and East Retford -                 | 70                | 22               | 8                | —              | 92                            |
| ENGLAND, S. -    | Reading, Maidstone, Downton, and Horsham.      | 62                | 28               | 6                | 4              | 90                            |
| SCOTLAND, W.     | Ardwell, Islay, and Dumbarton -                | 52                | 35               | 11               | 2              | 87                            |
| ENGLAND, N.W.    | Leyburn and Prescot -                          | 60                | 34               | 6                | —              | 94                            |
| ENGLAND, S.W.    | Tortworth, Clifton, Bridgend, and Glastonbury. | 66                | 23               | 9                | 2              | 89                            |
| IRELAND, N. -    | Moynalty and Edgeworthstown -                  | 58                | 32               | 10               | —              | 90                            |
| IRELAND, S. -    | Ardfert, Kilkenny, and Parsons-town.           | 56                | 34               | 8                | 2              | 90                            |
|                  | Mean for all districts -                       | 58                | 31               | 10               | 1              | 89                            |

TABLE II.—RETURN showing the NUMBER of FORECASTS sent to each of the under-mentioned PERSONS, with the SUCCESS or otherwise of the FORECASTS.

| Districts.          | To whom sent.                                                   | Addresses.                                                                | No. of<br>Forecasts<br>sent. | No. of<br>Forecasts<br>checked. | Per-centages.        |                     |                   | Remarks.                                                                                                                                   |
|---------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------|---------------------------------|----------------------|---------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                 |                                                                           |                              |                                 | Complete<br>Success. | Partial<br>Success. | Total<br>Failure. |                                                                                                                                            |
| 0. SCOTLAND, N.     | Major Smith<br>Rev. Dr. Joass                                   | Munlochy, Inverness<br>Golspie, N.B.                                      | 30<br>30                     | 30<br>30                        | 43·3<br>36·7         | 40·0<br>43·3        | —<br>3·3          | Mr. Birkbeck says, "Forecasts have been<br>" very accurate indeed."                                                                        |
| 1. SCOTLAND, E.     | C. W. L. Forbes<br>J. J. Whitton                                | Aberfeldy<br>Glamis Castle, Glamis                                        | 30<br>26                     | 30<br>26                        | 56·7<br>53·9         | 33·3<br>34·6        | —<br>—            |                                                                                                                                            |
| 2. ENGLAND, N.E.    | G. Murdoch<br>J. Turner                                         | Rothiemay, Huntley<br>The Grange, Uleaby                                  | 30<br>30                     | 30<br>30                        | 36·7<br>63·3         | 56·7<br>16·7        | 3·3<br>3·3        |                                                                                                                                            |
| 3. ENGLAND, E.      | Sir Jacob Wilson<br>Sir J. B. Lawes, Bart.                      | Chillingham Barnes, Chatton,<br>Northumberland.<br>Rothamsted, St. Albans | 84<br>30                     | 77<br>30                        | 58·4<br>70·0         | 36·4<br>16·7        | —<br>—            |                                                                                                                                            |
| 4. MIDLAND COUNTIES | W. Birkbeck<br>E. E. Harcourt-Vernon                            | High House, Thorpe, Norwich<br>The Grove, Retford                         | 30<br>30                     | 30<br>30                        | 66·7<br>70·0         | 30·0<br>23·3        | —<br>—            |                                                                                                                                            |
| 5. ENGLAND, S.      | Professor Ohm<br>C. Whitehead                                   | Royal Agricultural College,<br>Cirencester.<br>Barming House, Maidstone   | 30<br>30                     | 30<br>30                        | 70·0<br>53·4         | 20·0<br>40·0        | 10·0<br>3·3       |                                                                                                                                            |
| 6. SCOTLAND, W.     | E. P. Squarey<br>Martin J. Sutton                               | The Moot, Downton, Wilts<br>Kidmore Grange, Caversham,<br>Oxford.         | 30<br>30                     | 30<br>30                        | 73·3<br>70·0         | 13·3<br>23·3        | 6·7<br>6·7        |                                                                                                                                            |
| 7. ENGLAND, N.W.    | The Aylesbury Dairy<br>Company, Limited.<br>M. J. Stewart, M.P. | The Aylesbury Dairy Company<br>Limited, Horsham.<br>Ardwell, Wigtownshire | 42<br>30                     | 42<br>30                        | 52·4<br>46·7         | 35·7<br>40·0        | 4·8<br>—          |                                                                                                                                            |
| 8. ENGLAND, S.W.    | W. Calder<br>J. S. R. Ballingal                                 | Castle Hill, Dalreock, Dumbarton<br>Eallabus House, Islay                 | 30<br>30                     | 29<br>30                        | 69·0<br>40·0         | 20·7<br>43·3        | 3·4<br>3·3        | Mr. Harle (for the Earl of Ducie) re-<br>quested to be supplied with the fore-<br>casts during the wheat harvest.                          |
| 9. IRELAND, N.      | G. W. Wray<br>The Earl of Derby,<br>K.G.                        | Leyburn, R.S.O., Yorks.<br>Knowsley, Prescott                             | 30<br>24                     | 24<br>24                        | 62·5<br>58·3         | 37·5<br>29·2        | —<br>—            |                                                                                                                                            |
| 10. IRELAND, S.     | T. Dyke<br>R. Neville Grenville                                 | Long Ashton, Clifton, Bristol<br>Butleigh Court, Glastonbury              | 30<br>36                     | 30<br>36                        | 66·7<br>55·5         | 23·3<br>25·0        | 10·0<br>13·9      |                                                                                                                                            |
|                     | The Earl of Ducie<br>Col. T. P. Turbervill                      | Tortworth, Gloucestershire<br>Ewenny Priory, Bridgend, Gla-<br>morgan.    | 30<br>36                     | 30<br>36                        | 73·3<br>66·7         | 20·0<br>25·0        | 6·7<br>5·5        |                                                                                                                                            |
|                     | E. F. Farrell<br>J. M. Wilson, J.P.                             | Moynalty, Kells, Co. Meath<br>Currygrane, Edgeworthstown                  | 30<br>42                     | 30<br>42                        | 63·3<br>52·4         | 30·0<br>33·3        | 6·7<br>14·3       | Mr. Milward says, "The forecasts have<br>" been very accurate this season, and<br>" are much appreciated by farmers<br>" in the district." |
|                     | Dawson A. Milward<br>J. Wright for the<br>Earl of Rosse.        | Lavinstown, Kilkenny<br>Parsonstown                                       | 30<br>30                     | 30<br>30                        | 60·0<br>53·4         | 30·0<br>43·3        | 6·7<br>3·3        |                                                                                                                                            |
|                     | W. Talbot Crosbie                                               | Ardfert Abbey, Tralee                                                     | 30                           | 30                              | 53·4                 | 30·0                | 13·3              | 3·3                                                                                                                                        |

Submitted—The following statement of accounts :—

|                                 |   |   | £ | s.           | d.          |
|---------------------------------|---|---|---|--------------|-------------|
| Balance at Bank on 31st March   | - | - | - | 1,613        | 14 9        |
| Receipts from 1st to 20th April | - | - | - | 3,635        | 9 2         |
|                                 |   |   |   | <u>5,249</u> | <u>3 11</u> |
| Cheques drawn 1st to 20th April | - | - | - | 239          | 9 5         |
|                                 |   |   |   | <u>239</u>   | <u>9 5</u>  |
| Balance on this day             | - | - | - | £5,009       | 14 6        |

Submitted—The following list of publications which had been received since the last meeting :—

*Peking, Inspector General of Customs.*—List of the Chinese lighthouses, light-vessels, buoys, and seacons, for 1892.

*Ricciò, A.*—Terremoti, sollevamento ed eruzione sottomarina à Pantelleria nella seconda metà dell' Ottobre 1891.

*London, General Register Office.*—Annual summary of births, deaths, and causes of death in London and other great towns, 1891.

*Toronto, Magnetical Observatory.*—General meteorological register for the year 1891.

*Margate, Medical Officer of Health.*—Annual report of the Medical Officer of Health : also the meteorological report for the year 1891.

*London, Royal Meteorological Society.*—Hints to meteorological observers, with instructions for taking observations, and tables for their reduction.

*Warsaw, Oddzial Warszawski Towarzystwa Popierania Przemyslu i Handlu.*—Spostrzezenia meteorologiczne. 1886–88.

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63, Victoria Street, May 4, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN. | MR. STONE.  
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 20) were read and confirmed.

Mr. Scott reported that Mr. Symons had sent in on the 25th ultimo the lists of proposed substituted stations for his rain tables, with the dates of commencement of the records, &c., as requested by the Council (Minutes, 1891, p. 79). Mr. Scott was instructed to forward it to Mr. Buchan.

Reported—That Professor Grant (Letter 814) had gratefully accepted the supply of new thermometers on the terms proposed by the Council.

Reported—That Mr. Cullum had engaged J. Walsh as attendant at the new Valencia Observatory in the place of J. Healy (Letters No. 366 and 706) at 15s. weekly, as before allowed to J. Healy (Minutes, 1882–3, p. 19). The payment to Healy to be continued as caretaker of the old observatory until possession is given up on June 1.—Approved.

Read—A memorandum from Mr. Baillie stating that since last meeting six logs had been received, all of them being “excellent.” Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following report on the 8.30 p.m. forecasts for April 1892 :—

The letters used have the following signification :—

a=complete success.

b=partial (i.e., more than half) success.

c=partial failure.

d=total failure.

APRIL 1892.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 30            | 80       | 55                   | 80                                   |
| "                | b | 33            | 17       | 25                   |                                      |
| "                | c | 30            | 3        | 17                   |                                      |
| "                | d | 7             | 0        | 3                    |                                      |
| SCOTLAND, E.     | a | 44            | 60       | 52                   | 77                                   |
| "                | b | 23            | 27       | 25                   |                                      |
| "                | c | 23            | 13       | 18                   |                                      |
| "                | d | 10            | 0        | 5                    |                                      |
| ENGLAND, N.E.    | a | 50            | 67       | 59                   | 86                                   |
| "                | b | 27            | 27       | 27                   |                                      |
| "                | c | 17            | 6        | 11                   |                                      |
| "                | d | 6             | 0        | 3                    |                                      |
| ENGLAND, E.      | a | 37            | 53       | 45                   | 72                                   |
| "                | b | 23            | 30       | 27                   |                                      |
| "                | c | 27            | 17       | 22                   |                                      |
| "                | d | 13            | 0        | 6                    |                                      |
| MIDLAND COUNTIES | a | 44            | 60       | 52                   | 80                                   |
| "                | b | 33            | 23       | 28                   |                                      |
| "                | c | 13            | 17       | 15                   |                                      |
| "                | d | 10            | 0        | 5                    |                                      |
| ENGLAND, S.      | a | 33            | 50       | 42                   | 73                                   |
| "                | b | 30            | 33       | 31                   |                                      |
| "                | c | 17            | 17       | 17                   |                                      |
| "                | d | 20            | 0        | 10                   |                                      |
| SCOTLAND, W.     | a | 33            | 43       | 38                   | 65                                   |
| "                | b | 23            | 30       | 27                   |                                      |
| "                | c | 27            | 10       | 18                   |                                      |
| "                | d | 17            | 17       | 17                   |                                      |
| ENGLAND, N.W.    | a | 33            | 57       | 45                   | 67                                   |
| "                | b | 23            | 20       | 22                   |                                      |
| "                | c | 37            | 17       | 27                   |                                      |
| "                | d | 7             | 6        | 6                    |                                      |
| ENGLAND, S.W.    | a | 30            | 37       | 34                   | 69                                   |
| "                | b | 33            | 37       | 35                   |                                      |
| "                | c | 24            | 16       | 20                   |                                      |
| "                | d | 13            | 10       | 11                   |                                      |
| IRELAND, N.      | a | 20            | 50       | 35                   | 63                                   |
| "                | b | 33            | 23       | 28                   |                                      |
| "                | c | 37            | 20       | 29                   |                                      |
| "                | d | 10            | 7        | 8                    |                                      |
| IRELAND, S.      | a | 30            | 37       | 34                   | 62                                   |
| "                | b | 17            | 40       | 28                   |                                      |
| "                | c | 30            | 10       | 20                   |                                      |
| "                | d | 23            | 13       | 18                   |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 35            | 54       | 45                   | 72                                   |
| "                | b | 27            | 28       | 27                   |                                      |
| "                | c | 26            | 13       | 20                   |                                      |
| "                | d | 12            | 5        | 8                    |                                      |

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

## 1. WARNINGS ISSUED.

## SUMMARY.

A + B (successful) - - - = 10 districts.  
C (failures) - - - = 7 districts.

## 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
May 4, 1892.

Submitted—The following reports of work during the month of April 1892 :—

## MARINE BRANCH.

May 3, 1892.

Examined 8 new logs and one lighthouse register.

Extracting data from the logs of H.M. ships entering the district between the Cape of Good Hope and New Zealand, and grouping the winds in the six 10-degree squares adjacent to the Cape Colony for combining with the results obtained further east.

The winds for the Red Sea area have been grouped on the same plan as those for the Southern Ocean; the monthly charts have been drawn and partly examined.

For ocean currents 250 logs of men-of-war were received from the Public Record Office during the month. Currents are also being extracted from our own new logs received.

(Signed) CHAS. HARDING. as/

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.  
(To April 30, 1892.)*Weekly Weather Report :—*

1891.—In same condition as at time of last Report.

1892.—All numbers issued to date.

*Appendix I.*, Part 1.—In printer's hands; signed "for press."

*Appendix II.*, Part 2.—Well in hand.

*Monthly Summaries.*—January, in printer's hands. February, half done. March and April, well in hand.

*Daily Weather Report*, 1892.—All numbers issued promptly. Monthly correction and addition sheets issued up to March.

*Primary Checking of Storm Signals*, 1892.—Done to date.

*Complete Checking of Storm Signals*, 1891.—In hand; first two months done.

*Checking of Daily (8.30 p.m.) Forecasts*, 1892.—Done to date.

*Hay Harvest Forecasts*, 1891.—Checking handed in.

*Quarterly Weather Report*, 1881.—Preparation commenced.

(Signed) FREDC. GASTER.

May 4, 1892.

## PANTAGRAPH ROOM.

May 2, 1892.

*Hourly Means.*—A portion of the proofs of the tables for 1889 have been revised and signed for press, but there has been great delay on the part of the printer in sending in the remainder of the work.

The various means for the year 1890 are now being calculated.

The ordinary routine work of the Room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

## EXAMINATION BRANCH.

May 2, 1892.

*Examinations.*

*July—September 1890.*—Times and values of the daily *maxima* and *minima* atmospheric pressures for all observatories.

*December 1891.*—The examination of the work completed.

*March 1892.*—Partial examination of the Valencia work for the Registrar-General of Ireland.

Weekly examination (on receipt) of curves and documents.

*Miscellaneous.*

*Diurnal Range of Rainfall*, 1871–1890.—Examining and correcting the hourly values.

General routine work.

(Signed) T. E. ALLEN.



Submitted—The following statement of accounts :—

|                                            | £     | s. | d. |
|--------------------------------------------|-------|----|----|
| Cash balance on 20th April - - -           | 5,009 | 14 | 6  |
| Receipts from 20th April to 3rd May - -    | 16    | 15 | 2  |
|                                            | <hr/> |    |    |
|                                            | 5,026 | 9  | 8  |
| Cheques drawn from 20th April to 3rd May - | 1,146 | 19 | 9  |
|                                            | <hr/> |    |    |
| Balance on 3rd May - - -                   | 3,879 | 9  | 11 |
|                                            | <hr/> |    |    |

Submitted—The following list of publications which had been received since the last meeting :—

*Batavia, Magnetical and Meteorological Observatory.*—*Regenwaarnemingen in Nederlandsch—Indië.* 1890.

— — — *Observations.* Vol. xiii. 1890. Meteorological and magnetical observations made during the year 1890, and general results of meteorological observations made during a period of 25 years, 1866–1890.

*Perpignan, Commission Météorologique Départementale des Pyrénées Orientales.*—*Bulletin météorologique annuel.* 1890.

*Lang, C.*—*Zwei Influenza Epidemien in München und die sie begleitenden meteorologischen Verhältnisse.*

*Hamburg, Deutsche Seewarte.*—*Resultate meteorologischer Beobachtungen von Deutschen und Holländischen Schiffen für Eingradfelder des nordatlantischen Ozeans.* Quadrat 113. No. X.

*Riggenbach, A.*—*Die Geschichte der meteorologischen Beobachtungen in Basel.*

*Paul, G.*—*Observations of temperature of the Nidd from March 1889 to July 1891.*

*Singer, K.*—*Wolkentafeln.*

*Turner, G. E.*—*Detonation in meteorology.* A short account of the first proposal in England of artificial detonation in the atmosphere, in 1880, and of subsequent steps for its adoption.

*Washington, United States Naval Observatory.*—*Meteorological observations and results.* 1883–1887.

— — — A report upon some of the magnetic observatories of Europe, by C. C. Marsh.

— — — *Magnetic observations at the United States Naval Observatory, 1890,* by J. A. Hoogewerff.

*Madras, Government Observatory.*—*Results of the meteorological observations made at the Government Observatory, Madras, during the years 1861–1890.*

63, Victoria Street, May 18, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.  
MR. GALTON.

PROFESSOR DARWIN.  
MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 4) were read and confirmed.

Mr. Buchan submitted a memorandum (M.O. 983) on the subject of the stations proposed by Mr. Symons for the rain tables, and it was resolved that a definite scheme for the publication be prepared in the Office and brought up for consideration June 15.

Read—Letter 974 from Mr. Whipple (Minutes, 1891, p. 83), stating that he had adopted measures at Kew which he hoped would prevent the recurrence of carelessness in the work, such as had called for the Minute of the Council.

**Submitted—The following Report :—**

DEAR SIR,

Kew Observatory, May 7, 1892.

I BEG to report that in accordance with the request of the Council of the Meteorological Office contained in your communication of April 22nd to the Superintendent, I conveyed to the Glasgow Observatory on the 25th ultimo three new thermograph tubes and two Kew standard thermometers of reference from the Kew Observatory in order to replace the instruments which had been maliciously broken by some person on the night of April the 9th.

On my arrival I found that in the interval Professor Grant had had the thermograph screen repaired and properly strengthened by new supports.

After some slight alterations to the thermograph fittings and adjustments, two of the tubes were duly erected (as a dry and wet), and trial curves were first obtained on the morning of the 28th. It was, however, found necessary to make some further slight alterations, after which the thermograph was finally started on Thursday afternoon, April 28th, and the photographic curves developed on the following morning were found to be in every way satisfactory.

The spare thermograph tube, forming the triplet, was left at the observatory (Glasgow) for future use if required.

New glass scales, however, will have to be constructed for tabulating both dry and wet curves as soon as a sufficient number of standard eye-observations have been taken.

The following are the corrections to the new Kew standards of reference :—

|                    |   |   |   |   |                 |
|--------------------|---|---|---|---|-----------------|
| Dry-bulb, K.S. 708 | - | - | - | - | 0·0 throughout. |
| Wet-bulb, K.S. 709 | - | - | - | - | +0·1 „          |

During my visit I also inspected generally the barograph, anemograph, sun recorder, and the self-recording rain-gauge, all of which instruments were found to be working well, excepting that the pencil fittings of the last-named instrument had become jammed, so that the observer was unable to adjust it accurately to the zero-line of the rain-curve sheet. This I had put right before leaving.

The orientation of the anemograph was duly examined on the morning of April 29th, and the sheet containing the result accompanies this report as well as the thermograph trial curves.

The various thermometers were dismounted and compared with Kew Standard No. 682 at 52° Faht., and the following corrections were determined from the mean of three readings :—

|                                                               |   |   |   |   |      |
|---------------------------------------------------------------|---|---|---|---|------|
| Maximum, No. 58,846                                           | - | - | - | - | +0·1 |
| Minimum, No. 63,942                                           | - | - | - | - | -0·1 |
| Grass minimum, No. 59,003                                     | - | - | - | - | -0·1 |
| Barograph thermometer (no number)                             | - | - | - | - | -0·8 |
| Attached thermometer, No. K.O. 2479 to the standard barometer | - | - | - | - | -0·5 |

(Signed) T. W. BAKER.

R. H. Scott, Esq., F.R.S.

Read—Letter 674 from the Stationery Office, stating that the estimated cost of printing 600 copies of the trilingual catalogue of Congress Resolutions (Minutes, 1891, p. 90) was from 170*l.* to 180*l.* It was decided by the Council that they would not undertake to print the manuscript.

Read a memorandum by Mr. Whipple (Letter 931), on the subject of the material for use in the self-recording rain-gauges, instead of the waterproof paper hitherto supplied by Messrs. de la Rue, and recommending the use of Willesden paper.

Mr. Scott was instructed to have a supply of forms, printed on Willesden paper, provided for further experiments at Kew.

Read—A memorandum from Mr. Baillie, stating that since last meeting three logs had been received, two of them being “ excellent.”

Mr. Scott was instructed to convey the best thanks of the Council to the observers.

**Submitted—The following memorandum :—**

Since the last meeting of the Council, there have been no warnings issued, nor any gales experienced on the coasts of the British Islands.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
May 18, 1892.

**Submitted—The following statement of accounts :—**

|                                    |   |   | £ | s.    | d.   |
|------------------------------------|---|---|---|-------|------|
| Cash balance on 3rd May            | - | - | - | 3,879 | 9 11 |
| Receipts from 4th to 17th May      | - | - | - | 34    | 15 7 |
|                                    |   |   |   | <hr/> |      |
|                                    |   |   |   | 3,914 | 5 6  |
| Cheques drawn from 4th to 17th May | - | - | - | 118   | 2 3  |
|                                    |   |   |   | <hr/> |      |
| Balance on 17th May                | - | - | - | 3,796 | 3 3  |
|                                    |   |   |   | <hr/> |      |

Submitted—The following list of publications which had been received since the last meeting :—

*Vienna, K.K. Geographische Gesellschaft.*—Mittheilungen. 1891.

*Upsala, Observatoire Météorologique.*—Bulletin Mensuel. 1891.

*Wollny, E.*—Untersuchungen über die Bildung und die Menge des Thaues.

*Washington, Department of Agriculture.*—Meteorological work for Agricultural Institutions.

*Scott, R. H.*—Atlantic weather and its connection with British weather.

*Dickson, H. N.*—The meteorology of India and the surrounding sea-areas.

*Abbe, C.*—Cloud observations at sea.

*Tromelin, G. Le G. De.*—Note sur les causes originelles des cyclones et leurs signes précurseurs.

63, Victoria Street, June 1, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN.

MR. GALTON.

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

Read—A memorandum from Mr. Baillie, stating that since last meeting six logs had been received, three of them being “excellent.” Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

(1.) WARNINGS ISSUED.

|                    |   |   |   |   |                |
|--------------------|---|---|---|---|----------------|
| A + B (successful) | - | - | - | - | = 2 districts. |
| C (failures)       | - | - | - | - | = 0 districts. |

(2.) GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

Telegraphic Branch,  
June 1, 1892.

(Signed) FREDC. GASTER,

Submitted—The following reports of work during the month of May 1892 :—

MARINE BRANCH.

June 1, 1892.

Examined 9 new logs.

Discussion of the meteorology of the district between the Cape of Good Hope and New Zealand. Adding information obtained from the logs of H.M. ships received in Office for the plotting of currents. Grouping the winds for the new district, also grouping the winds in the six 10-degree squares adjacent to the Cape of Good Hope, for combining with the results obtained further east.

For ocean currents 500 logs of men-of-war were received from the Public Record Office during the month, and a very large number of currents have been obtained from the Orient Steam Navigation Company by a member of the staff of the Office, to supply information for the parts of the ocean where data are at present very scanty.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 31st May 1892.)

*Weekly Weather Report*, 1891.—Title-page and preface, completed and sent “for press.”

*Weekly Weather Report*, 1892.—All numbers issued promptly to date.

*Appendix I., Part 1.*—Issued.

“ *II.*—Well up to date.

*Monthly Summaries.*—*January* gone “for press.” *February, &c.*, in hand.

*Daily Weather Report, 1892.*—All numbers issued promptly to date. Monthly correction and addition sheets issued to those for April.

*Primary Checking of Storm Signals, 1892.*—Done to date.

*Final Checking of Storm Signals, 1891.*—Completed, with exception of summary, now in hand.

*Checking of Daily (8.30 p.m.) Forecasts.*—Well in hand. Summary for May ready in a few days.

*Plotting, &c. of Rainfall Stations (Mr. Symons) for Council.*—Well in hand, but delayed somewhat by official holidays and other work.

*Preparation of Inspection Notes, England, 1892.*—Completed, and Mr. Ley interviewed. There have been several "inquiries" from solicitors and others during past few days, needing much attention. Two of them occupied all of my own (private time) for three evenings, one afternoon, and one morning (6 a.m. to 8 a.m.).

(Signed) FREDC. GASTER.

Telegraphic Branch,  
2nd June 1892.

#### PANTAGRAPH ROOM.

June 1, 1892.

*Hourly Means.*—The calculation of the various tables of hourly and other means for the year 1890 has been carried on throughout the month. No further progress has been made with the revision of the proof of the tables for 1889, the printer having failed to deliver any proofs during the past month.

The routine work of the Room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

#### EXAMINATION BRANCH.

June 1, 1892.

##### *Examinations.*

*October–December, 1890.*—Times and values of the daily *maxima* and *minima* atmospheric pressures for all observatories.

*January and February, 1892.*—Partial.

Weekly examination (on receipt) of curves and documents.

##### *Reports.*

*November and December, 1891.*—Copies of "Notes of Errors" to all observatories.

##### *Miscellaneous.*

*Diurnal Range of Rainfall, 1871–1890.*—Examining and correcting the hourly values.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts:—

|                                           | £     | s. | d. |
|-------------------------------------------|-------|----|----|
| Cash balance on 17th May - - -            | 3,796 | 3  | 3  |
| Receipts from 17th to 31st May - - -      | 49    | 17 | 11 |
|                                           | 3,846 | 1  | 2  |
| Cheques drawn from 18th to 31st May - - - | 1,056 | 5  | 10 |
|                                           | 2,789 | 15 | 4  |
| Balance on 31st May - - -                 |       |    |    |

Submitted—The following list of publications which had been received since the last meeting:—

*Bucharest, Institutul Meteorologic al Romaniei.*—Analele. Tom. v. 1889.

*Rome, Specola Vaticana.*—Pubblicazioni. Fasc. ii.

*Trabert, W.*—Der tägliche Gang der Temperatur und des Sonnenscheins auf dem Sonnblickgipfel.

*Prince, C. L.*—The summary of a meteorological journal kept by C. L. Prince at his Observatory, Crowborough Hill, Sussex, 1891.

*Blanford, H. F.*—On meteorological observations in tropical countries.

*Colombo, Public Works Department.*—Return of rainfall in Ceylon during 1891 and the means during different periods.

*Chwolson, O.*—Über den gegenwärtigen Zustand der Actinometrie.

*Lang, C.*—Welchem Zwecke sollen die Wettersäulen dienen?

*Hann, J.*—Weitere Untersuchungen über die tägliche Oscillation des Barometers.

63, Victoria Street, June 15, 1892.

PRESENT :

LIEUT. GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.  
MR. GALTON.

PROFESSOR DARWIN.  
MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last two meetings (May 18 and June 1) were read and confirmed.

Mr. Scott submitted the following memorandum with reference to the proposed publication of rain means (Minutes, p. 15), with specimen maps, drawn up by Mr. Gaster :—

MEMORANDUM.

From an examination of the correspondence, the Minutes of Council, and other papers, it is gathered that the Council wish the new work to consist of three parts.

Part I. to show—

- A. Monthly and annual values for the 10 years 1881–90, and means for each lustrum for all, or nearly all, that portion of the stations contained in the 1883 publication, for which Mr. Symons can furnish the figures.
- B. Similar values for those of the remaining stations, the records for which, though incomplete for the decade 1881–90, are available for five years, or more, after the close of 1880 (to which time the values in the 1883 publication extended).

Part II. to show—

- A. For the 10 years 1881–90, similar values for certain additional stations, in order to supply information for districts not represented in Part I.
- B. Similar values for the 5 years, or more, previous to 1881, for all these stations where such details are available.

Part III. to show—

Complete monthly and annual values for certain selected stations having records which extend over a long series of not less than 25 years.

The following queries, however, seem to require more precise instructions :—

1. In certain waterworks districts, where the stations given in the 1883 publication are *very* close together, shall the continued records for these be *all* accepted, or shall a selection be made, say, of stations showing greatest and least annual fall?
2. The list of “substituted” stations forwarded by Mr. Symons gives positions which, if accepted, would make a superabundance for some districts. May these be thinned out?
3. In preparing the final lists shall not the stations be re arranged. The order observed in 1883 publication is bad. The *counties* are not in any meteorological order, and the *stations* are not arranged in the counties according to any rule.
4. In tabulating and plotting shall not the name of the station come first and its nearest large town second, instead of the reverse?

If the principle of re-arrangement be approved, a plan could be submitted, say, a month hence.

Meteorological Office,  
15th June 1892.

The Council decided as follows, in reply to the four points raised in the memorandum :—

1. In case of difference of 10 per cent. or less, one station should suffice for the group.
2. In the case of Mr. Symons’s suggested new stations, it was considered that distances of 15 or 20 miles between the stations would be sufficient, as a rule.
- 3 and 4. To both questions the answer was Yes.

Read—A memorandum stating that since last meeting eight logs had been received, six of them being “excellent.” Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following report on the 8.30 p.m. forecasts for May 1892 :—

The letters used have the following signification :—

a = complete success.

b = partial (i.e. more than half) success.

c = partial failure.

d = total failure.

MAY.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 32            | 61       | 47                   | 82                                   |
| "                | b | 45            | 26       | 35                   |                                      |
| "                | c | 16            | 13       | 15                   |                                      |
| "                | d | 7             | 0        | 3                    |                                      |
| SCOTLAND, E.     | a | 39            | 61       | 50                   | 74                                   |
| "                | b | 35            | 13       | 24                   |                                      |
| "                | c | 23            | 20       | 22                   |                                      |
| "                | d | 3             | 6        | 4                    |                                      |
| ENGLAND, N.E.    | a | 48            | 71       | 60                   | 81                                   |
| "                | b | 23            | 19       | 21                   |                                      |
| "                | c | 26            | 10       | 18                   |                                      |
| "                | d | 3             | 0        | 1                    |                                      |
| ENGLAND, E.      | a | 42            | 68       | 55                   | 88                                   |
| "                | b | 42            | 23       | 33                   |                                      |
| "                | c | 10            | 6        | 8                    |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| MIDLAND COUNTIES | a | 61            | 71       | 66                   | 89                                   |
| "                | b | 26            | 20       | 23                   |                                      |
| "                | c | 10            | 3        | 7                    |                                      |
| "                | d | 3             | 6        | 4                    |                                      |
| ENGLAND, S.      | a | 49            | 61       | 55                   | 86                                   |
| "                | b | 35            | 26       | 31                   |                                      |
| "                | c | 6             | 10       | 8                    |                                      |
| "                | d | 10            | 3        | 6                    |                                      |
| SCOTLAND, W.     | a | 45            | 78       | 62                   | 78                                   |
| "                | b | 19            | 13       | 16                   |                                      |
| "                | c | 23            | 6        | 14                   |                                      |
| "                | d | 13            | 3        | 8                    |                                      |
| ENGLAND, N.W.    | a | 52            | 71       | 62                   | 81                                   |
| "                | b | 26            | 13       | 19                   |                                      |
| "                | c | 16            | 10       | 13                   |                                      |
| "                | d | 10            | 6        | 8                    |                                      |
| ENGLAND, S.W.    | a | 45            | 68       | 57                   | 88                                   |
| "                | b | 39            | 23       | 31                   |                                      |
| "                | c | 13            | 6        | 9                    |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| IRELAND, N.      | a | 52            | 74       | 63                   | 89                                   |
| "                | b | 32            | 20       | 26                   |                                      |
| "                | c | 3             | 3        | 3                    |                                      |
| "                | d | 13            | 3        | 8                    |                                      |
| IRELAND, S.      | a | 45            | 45       | 45                   | 81                                   |
| "                | b | 39            | 32       | 36                   |                                      |
| "                | c | 10            | 10       | 10                   |                                      |
| "                | d | 6             | 13       | 9                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 46            | 66       | 56                   | 83                                   |
| "                | b | 33            | 21       | 27                   |                                      |
| "                | c | 14            | 9        | 12                   |                                      |
| "                | d | 7             | 4        | 5                    |                                      |

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

1. WARNINGS ISSUED.

Summary.

|                    |   |   |   |   |              |
|--------------------|---|---|---|---|--------------|
| A + B (successful) | - | - | - | = | 3 districts. |
| C (failures)       | - | - | - | = | 2 districts. |

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed)      FREDC. GASTER.

Telegraphic Branch,  
15th June 1892.

Submitted—The following—

RETURN of the RESULT of the COMPARISON between the WARNINGS ISSUED and the WEATHER EXPERIENCED in 1890.

| DISTRICTS.           | Total Number of Orders to Hoist and Repetitions. | Warnings justified by subsequent Gales. Force 8 and upwards. | Warnings justified by subsequent strong Winds. Forces 6 and 7. | Warnings not justified by subsequent Weather. | Warnings late. Force 9 reached at two Stations before issue. | Warnings partially late. Force 9 reached at one Station before issue. | Warnings in error owing to Telegraphic Mistakes. | STORMS FOR WHICH NO WARNING WAS ISSUED. |
|----------------------|--------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|
| SCOTLAND, N.E.       | 50                                               | 35                                                           | 9                                                              | 2                                             | 1                                                            | 3                                                                     | —                                                |                                         |
| Do. E.               | 35                                               | 13                                                           | 18                                                             | 4                                             | —                                                            | —                                                                     | —                                                | Dec. 15.                                |
| Do. N.W.             | 52                                               | 30                                                           | 14                                                             | 4                                             | 4                                                            | —                                                                     | —                                                | Dec. 15.                                |
| Do. W.               | 44                                               | 27                                                           | 12                                                             | 5                                             | —                                                            | —                                                                     | —                                                | Mar. 2, Nov. 11.                        |
| IRELAND, S.W.        | 46                                               | 35                                                           | 5                                                              | 5                                             | —                                                            | 1                                                                     | —                                                | Mar. 5-6, May 15, Nov. 28,              |
| Do. N.W.             | 53                                               | 39                                                           | 7                                                              | 1                                             | 1                                                            | 5                                                                     | —                                                | Dec. 15.                                |
| IRISH SEA            | 41                                               | 30                                                           | 4                                                              | —                                             | 1                                                            | 6                                                                     | —                                                | Mar. 5-6, May 15, Oct. 11.              |
| ST. GEORGE'S CHANNEL | 36                                               | 20                                                           | 10                                                             | 3                                             | 1                                                            | 2                                                                     | —                                                | Dec. 7.                                 |
| BRISTOL CHANNEL      | 34                                               | 20                                                           | 11                                                             | 3                                             | —                                                            | —                                                                     | —                                                | Dec. 7.                                 |
| ENGLAND, S.W.        | 33                                               | 18                                                           | 10                                                             | 3                                             | —                                                            | 2                                                                     | —                                                | Dec. 7.                                 |
| Do. S.               | 27                                               | 15                                                           | 10                                                             | 2                                             | —                                                            | —                                                                     | —                                                |                                         |
| Do. S.E.             | 25                                               | 15                                                           | 8                                                              | 2                                             | —                                                            | —                                                                     | —                                                | Oct. 22.                                |
| Do. E.               | 22                                               | 10                                                           | 8                                                              | 4                                             | —                                                            | —                                                                     | —                                                |                                         |
| Do. N.E.             | 24                                               | 18                                                           | 2                                                              | 1                                             | 1                                                            | 2                                                                     | —                                                | Feb. 11, Mar. 5-6, May 15,              |
|                      |                                                  |                                                              |                                                                |                                               |                                                              |                                                                       |                                                  | Nov. 11, Dec. 3.                        |
| TOTALS               | 522                                              | 325                                                          | 128                                                            | 39                                            | 9                                                            | 21                                                                    | —                                                |                                         |
| PER-CENTAGES         | —                                                | 62·3                                                         | 24·5                                                           | 7·5                                           | 1·7                                                          | 4·0                                                                   | —                                                |                                         |

It was resolved that self-recording aneroids be supplied to the telegraphic stations of Dunrossness and Mullaghmore.

Submitted—The following statement of accounts :—

|                                     |   |   |   |       |    |    |
|-------------------------------------|---|---|---|-------|----|----|
| Cash balance on 31st May            | - | - | - | £     | s. | d. |
| Receipts from 1st to 14th June      | - | - | - | 2,789 | 15 | 4  |
|                                     |   |   |   | 15    | 13 | 7  |
|                                     |   |   |   | 2,805 | 8  | 11 |
| Cheques drawn from 1st to 14th June | - | - | - | 38    | 13 | 10 |
|                                     |   |   |   | 2,766 | 15 | 1  |

Read—A letter (No. 1117) from the Imperial Institute, asking for the publications of the Office.—Granted.

**Submitted**—The following list of publications which had been received since the last meeting :—

*Mohn, H.*—Studien über Nebelsignale.

— Mittheilungen aus dem Norwegischen meteorologischen Institute.

*Strassburg, Meteorologischer Landesdienst in Elsass-Lothringen.*—Ergebnisse der meteorologischen Beobachtungen im Reichsland Elsass-Lothringen im Jahre 1890.

*Etienne, E.*—Le climat de Banana en 1890, suivi des observations météorologiques faites du 1<sup>er</sup> décembre 1889 au 16 mai 1891.

*Carlsruhe, Centralbureau für Meteorologie und Hydrographie.*—Beiträge zur Hydrographie des Grossherzogthums Baden. Siebentes Heft.

*Washington, Weather Bureau.*—Diurnal fluctuations of atmospheric pressure at twenty-nine selected stations in the United States.

— — Irrigation and water storage in the arid regions.

— — Charts showing maximum and minimum temperatures, by decades, for all years.

63, Victoria Street, June 29, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.

PROFESSOR DARWIN.

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 15) were read and confirmed.

The draft Report of the Office for the year 1891–2 (Minutes, p. 7) was again considered and adopted, and the Secretary was instructed to forward it to the Royal Society (P.C. 1247).

Read—Letter 1174 from Mr. R. Bushell, asking for an expression of opinion from the Council as to the maintenance of the meteorological observations and records at Bidston Observatory. Mr. Scott was instructed to reply that the Council would consider it a great misfortune if the meteorological tables issued in the Bidston reports were discontinued (P.C. 1244).

Read—Letter 1059 :—

(M.O. 1059.)

Royal Meteorological Society,  
22, Great George Street, Westminster, S.W.,  
May 31, 1892.

SIR,

I AM directed to inform you that, as the result of various meetings of the wind force committee of this Society, and of consideration of the results of Mr. Dines's experiments at Oxshott, Messrs. Dines and Munro were requested to prepare working drawings of a proposed modification of Hagemann's tube anemometer. These drawings have been considered by the wind force committee to day, and seemed to them so satisfactory that the designers have been requested to prepare a written description, and forward the same, with the diagrams, to you for submission to the Meteorological Council.

Yours, &c.

(Signed) F. CAMPBELL BAYARD,  
Secretary.

Read—Also a letter (1231) from Mr. Munro, accompanying working drawings of an anemometer, and a report by Mr. Dines.

The subject was referred to Mr. Galton.

Read—A letter from Mr. Baillie stating that since last meeting eight logs had been received, five of them being "excellent," and recommending Captain B. G. Armstrong, SS. "Para," for a copy of charts O. 76.

Mr. Scott was instructed to present the charts to Captain Armstrong, and to convey the best thanks of the Council to the other observers.

Read—Letter 1212 from the Royal Meteorological Society, asking for a grant of 25*l.* towards inspection expenses, as in previous years.—Granted.

Submitted—The following statement respecting the Records for July to December, 1891, received from the Self-recording Observatories (see Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889):—

| JULY—DECEMBER.                                                                       | ABERDEEN.  |           | ARMAGH.              |            | FALMOUTH.     |              | FORT WILLIAM. |              | KEW.       |           | VALENCIA.  |           |
|--------------------------------------------------------------------------------------|------------|-----------|----------------------|------------|---------------|--------------|---------------|--------------|------------|-----------|------------|-----------|
| <b>ANEMOGRAPH :—</b>                                                                 | Direction. | Velocity. | Direction.           | Velocity.  | Direction.    | Velocity.    | Direction.    | Velocity.    | Direction. | Velocity. | Direction. | Velocity. |
| <i>Action of Instrument</i> -                                                        | Good.      | Good.     | Good.                | Fair.      | Good.         | Good.        | —             | —            | Good.      | Good.     | Good.      | Good.     |
| <i>Records deficient :—</i>                                                          |            |           |                      |            |               |              |               |              |            |           |            |           |
| Due to stoppage of clock                                                             | 0          | 0         | 31 hrs.              | 31 hrs.    | 0             | 0            | —             | —            | 3 hrs.     | 3 hrs.    | 4 hrs.     | 4 hrs.    |
| „ other causes -                                                                     | 2 hrs.     | 4 hrs.    | 5 hrs.               | 5 hrs.     | 3 hrs.        | 4 hrs.       | —             | —            | 0          | 1 hr.     | 0          | 0         |
| <i>No. of errors discovered :—</i>                                                   |            |           |                      |            |               |              |               |              |            |           |            |           |
| By general examination                                                               | 0          | 0         | 0                    | 31         | 49            | 1            | —             | —            | 11         | 0         | 6          | 2         |
| <i>Rslts. of 40 Remeasmts. :—</i>                                                    |            |           |                      |            |               |              |               |              |            |           |            |           |
| Greatest difference -                                                                | 1·0        | 2·0       | 1·0                  | 2·0        | 1·0           | 2·0          | —             | —            | 1·0        | 1·0       | 1·0        | 2·0       |
| Mn. diff. irrespectv. of sign                                                        | 0·2        | 0·5       | 0·2                  | 0·5        | 0·2           | 0·5          | —             | —            | 0·2        | 0·4       | 0·2        | 0·5       |
| Residual diff. (— M. O.) -                                                           | 0·0        | 0·0       | 0·0                  | —0·1       | 0·0           | 0·0          | —             | —            | —0·1       | 0·0       | 0·0        | 0·0       |
| <i>Orientation verified</i> -                                                        | Monthly    | —         | Monthly              | —          | Monthly       | —            | —             | —            | Monthly    | —         | Monthly    | —         |
| <b>RAIN-GAUGE :—</b>                                                                 |            |           |                      |            |               |              |               |              |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.      |           | Good to Indifferent. |            | Good.         |              | Good to Fair. |              | Good.      |           | Good.      |           |
| <i>Records deficient :—</i>                                                          |            |           |                      |            |               |              |               |              |            |           |            |           |
| Due to stoppage of clock                                                             | 0          |           | 0                    |            | 2 hrs.        |              | 5 hrs.        |              | 0          |           | 8 hrs.     |           |
| „ other causes -                                                                     | 39 hrs.    |           | 3 hrs.               |            | 0             |              | 6 hrs.        |              | 8 hrs.     |           | 2 hrs.     |           |
| <i>No. of errors discovered :—</i>                                                   |            |           |                      |            |               |              |               |              |            |           |            |           |
| By general examination                                                               | 0          |           | 3                    |            | 3             |              | 12            |              | 38         |           | 4          |           |
| —                                                                                    | ABERDEEN.  |           | FALMOUTH.            |            | FORT WILLIAM. |              | KEW.          |              | VALENCIA.  |           |            |           |
| <b>BAROGRAPH :—</b>                                                                  |            |           |                      |            |               |              |               |              |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.      |           | Good.                |            | Good.         |              | Good.         |              | Good.      |           | Good.      |           |
| <i>Character of Photography</i>                                                      | Do.        |           | Very Good.           |            | Good to Fair. |              | Do.           |              | Do.        |           | Do.        |           |
| <i>Records deficient :—</i>                                                          |            |           |                      |            |               |              |               |              |            |           |            |           |
| Due to stoppage of clock                                                             | 0          |           | 0                    |            | 14 hrs.       |              | 0             |              | 0          |           | 0          |           |
| „ failure of light -                                                                 | 0          |           | 0                    |            | 5 hrs.        |              | 1 hr.         |              | 0          |           | 0          |           |
| „ other causes -                                                                     | 4 hrs.     |           | 2 hrs.               |            | 6 hrs.        |              | 6 hrs.        |              | 0          |           | 0          |           |
| <i>No. of errors discovered :—</i>                                                   |            |           |                      |            |               |              |               |              |            |           |            |           |
| In entry of standards -                                                              | 0          |           | 1                    |            | 14            |              | 5             |              | 1          |           | 1          |           |
| „ calculating residuals -                                                            | 0          |           | 3                    |            | 13            |              | 2             |              | 2          |           | 2          |           |
| „ applying „ -                                                                       | 1          |           | 1                    |            | 12            |              | 4             |              | 3          |           | 3          |           |
| „ maxima and minima -                                                                | 0          |           | 2                    |            | 14            |              | 1             |              | 5          |           | 5          |           |
| By general examination -                                                             | 1          |           | 10                   |            | 48            |              | 59            |              | 37         |           | 37         |           |
| <i>Rslts. of 40 Remeasmts. :—</i>                                                    |            |           |                      |            |               |              |               |              |            |           |            |           |
| Greatest difference -                                                                | ·006       |           | ·008                 |            | ·007          |              | ·007          |              | ·008       |           | ·008       |           |
| Mn. diff. irrespectv. of sign                                                        | ·002       |           | ·002                 |            | ·002          |              | ·002          |              | ·002       |           | ·002       |           |
| Residual diff. (— M. O.) -                                                           | ·000       |           | —·001                |            | ·000          |              | ·000          |              | ·000       |           | ·000       |           |
| <i>Mean monthly diff. between simultaneous Barograph and Stand. Bar. readings</i> -  | ·001       |           | ·002                 |            | ·002          |              | ·002          |              | ·002       |           | ·002       |           |
| <b>THERMOGRAPH :—</b>                                                                |            |           |                      |            |               |              |               |              |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.      |           | Good.                |            | Good.         |              | Good.         |              | Good.      |           | Good.      |           |
| <i>Character of Photography</i>                                                      | Do.        |           | Do.                  |            | Do.           |              | Do.           |              | Do.        |           | Do.        |           |
| <i>Records deficient :—</i>                                                          |            |           |                      |            |               |              |               |              |            |           |            |           |
| Due to stoppage of clock                                                             | Dry. 0     | Wet. 0    | Dry. 1 hr.           | Wet. 1 hr. | Dry. 18 hrs.  | Wet. 18 hrs. | Dry. 54 hrs.  | Wet. 54 hrs. | Dry. 0     | Wet. 0    | Dry. 0     | Wet. 0    |
| „ failure of light -                                                                 | 0          | 0         | 0                    | 0          | 1 hr.         | 0            | 9 hrs.        | 0            | 0          | 0         | 7 hrs.     | 0         |
| „ imperfectly moist. bulbs                                                           | —          | 7 hrs.    | —                    | 18 hrs.    | —             | 7 hrs.       | —             | 5 hrs.       | —          | —         | —          | 0         |
| „ partly frozen bulbs                                                                | —          | 86 hrs.   | —                    | 0          | —             | 15 hrs.      | —             | 22 hrs.      | —          | —         | —          | 0         |
| „ other causes -                                                                     | 3 hrs.     | 2 hrs.    | 4 hrs.               | 4 hrs.     | 11 hrs.       | 11 hrs.      | 8 hrs.        | 24 hrs.      | 0          | 0         | 0          | 0         |
| <i>No. of errors discovered :—</i>                                                   |            |           |                      |            |               |              |               |              |            |           |            |           |
| In entry of standards -                                                              | 0          | 0         | 2                    | 2          | 5             | 8            | 3             | 6            | 2          | 2         | 2          | 2         |
| „ maxima and minima -                                                                | 3          | —         | 5                    | —          | 22            | —            | 13            | —            | 4          | —         | —          | —         |
| By general examination -                                                             | 4          | 1         | 5                    | 3          | 26            | 31           | 10            | 26           | 15         | 8         | 15         | 8         |
| <i>Rslts. of 40 Remeasmts. :—</i>                                                    |            |           |                      |            |               |              |               |              |            |           |            |           |
| Greatest difference -                                                                | 0·2        | 0·2       | 0·3                  | 0·3        | 0·6           | 0·8          | 0·2           | 0·4          | 0·2        | 0·2       | 0·2        | 0·2       |
| Mn. diff. irrespectv. of sign                                                        | 0·1        | 0·1       | 0·1                  | 0·1        | 0·1           | 0·3          | 0·1           | 0·1          | 0·1        | 0·1       | 0·1        | 0·1       |
| Residual diff. (— M. O.) -                                                           | —0·1       | 0·0       | 0·0                  | 0·0        | +0·1          | 0·0          | 0·0           | 0·0          | 0·0        | 0·0       | 0·0        | 0·0       |
| <i>Mean monthly diff. between simultaneous Thermograph and Stand. Ther. readings</i> | 0·2        | 0·2       | 0·1                  | 0·2        | 0·1           | 0·1          | 0·1           | 0·2          | 0·2        | 0·2       | 0·2        | 0·2       |

## ANEMOGRAMS.

*Aberdeen.*—The working of the instrument was satisfactory throughout the period, and the bearings were well oiled.

*Armagh.*—Beyond the mechanical defect alluded to in previous reports, causing the velocity traces to be intermittent at low rates, the instrument worked satisfactorily, but no mention of its having been oiled was recorded.

*Falmouth.*—The instrument was regularly oiled at intervals of about six weeks.

*Kew.*—Trouble was experienced with the pricker, and on September 15th it was examined and straightened; in the following month (2nd), however, a new pricker was fitted. The clamp pin was found cut through on September 13th, and a new pin substituted on the 14th. Attention was called to the serrated appearance of the velocity traces, at moderate rates, which was most marked in December. The instrument was regularly oiled in exposed parts, and the velocity shaft "eased" on December 11th.

*Valencia.*—The working of the instrument was satisfactory.

## RAIN-GAUGES.

*Aberdeen.*—The attachment of the papers to the cylinder was occasionally inaccurate, and during November the action of the instrument was very imperfect, apparently owing to the pencil being too hardly pressed against the paper.

*Armagh.*—The attachment of the papers was too often unsatisfactory.

*Falmouth.*—No exception could be taken to the returns from this observatory, and the traces are exceptionally good.

*Kew.*—The instrument worked imperfectly in August, otherwise there was no fault to find.

*Fort William.*—The action of this instrument was not altogether satisfactory, and special attention was drawn to this fact in October. There was an improvement in the following month, but in the December "Notes of Errors" attention was again drawn to the subject; also to the tabulation of  $\cdot 001$  and  $\cdot 002$  in., the assistant being requested to discontinue tabulating to lesser amounts than  $\cdot 003$  in.

*Valencia.*—The attachment of the papers was not always good, but instrument worked satisfactorily.

## BAROGRAMS.

*Aberdeen.*—Much trouble with the action of the light shutter was experienced during the latter part of the period.

*Falmouth.*—The instrument was in good order, and worked satisfactorily.

*Fort William.*—Attention was called to the serious loss of trace occasioned by want of greater attention to the lamps, and suggestions were made with the view of improvement in this respect.

*Kew.*—In July a peculiar appearance was given to curve 209–210 owing to there being some bubbles of mercury in front of the slit through which the light is thrown; these were removed on the 29th. The regulation of the clock being bad, led to an examination, when the pallets were found to be much worn, allowing a tooth of the escape wheel to occasionally slip. The clock was dismounted and repaired.

*Valencia.*—The light was not always good, and attention was drawn thereto in December; otherwise the working of the instrument was satisfactory.

## THERMOGRAMS.

*Aberdeen.*—The light shutter gave great trouble throughout the month, and again in October; the zero-lines were changed from summer to winter positions on the 13th October.

*Falmouth.*—Instrument worked satisfactorily. The zero-lines were changed from summer to winter positions on the 10th November.

*Fort William.*—Great difficulty was experienced with the light-shutter, the action being very imperfect for days together. Special attention was called to the neglect of the assistant in failing to detect the fact, and in not endeavouring to ascertain the cause. Zero-lines changed from summer to winter positions on the 3rd October.

*Kew.*—The tube of the wet-bulb instrument was re-blackened in July. The zero-lines were changed from summer to winter positions on the 19th October, when secondary images appeared on the curves interfering with the wet trace. The mirror of the wet-bulb was accidentally touched and put out of position, but restored at 6.10 p.m. on the 10th of November. The "dots" were raised on the 17th and 21st of December in consequence of the low temperatures which occasionally put the trace nearly out of focus.

*Valencia.*—The "dots" were raised to bring the traces into focus on the 7th July, and zero-lines were changed from summer to winter positions on 29th October. Owing to a flaw in the tube, the trace of the dry-bulb is occasionally interfered with by secondary images.

## GENERAL.

*Aberdeen.*—Work good and generally reliable, although the agreement between the values in the A. and B. columns of the subsidiary sheets is phenomenal, probably adjusted for small differences; the agreement between the hourly values by the barograph and the check readings of the

standard, is apparently good. The instrument was examined and cleaned on the 13th–15th October.

*Armagh*.—See notes.

*Falmouth*.—A high standard of efficiency with the curves generally has been attained at this observatory, the photography is excellent, and the rain traces leave nothing to be desired. The annual examination took place on the 8th–14th August.

*Fort William*.—The assistants at this observatory have not quite succeeded in obtaining the degree of efficiency required, as will be seen by the number of errors recorded under the heading of “General examination.” The instruments were duly examined and cleaned on the 3rd–5th October.

*Kew*.—An improvement on the work of the previous six months, but evidence of the hurried manner in which the clerical part of the work is carried out is not wanting. A general inspection of the instruments is made from time to time.

*Valencia*.—Fairly good generally. Annual inspection of instruments did not take place in view of the contemplated transfer of the observatory.

The calculations in connexion with the “Diurnal Range of Rainfall, 1871–90,” fully show the necessity for a natural zero-line to the rain-gauge curve as a check on the printed form, and this could easily be supplied were the observers instructed to obtain a complete revolution of the cylinder before starting the instrument for the daily record. This is especially necessary at Aberdeen and Falmouth where the total daily falls are not collected in the receivers and measured, as a check on the traces.

(Signed) T. E. ALLEN.

#### Submitted—The following Report :—

Since the last meeting of the Council there have been no warnings issued, nor any gales experienced on the coasts of the British Islands.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
June 29, 1892.

Reported—That the cash accounts for the six months ended the 31st March 1892 had been audited on the 24th instant by the Chairman and Mr. Stone, and would be sent in due course to the Treasury for the Audit Office. The receipts for the six months amounted to 8,573*l.* 9*s.* 8*d.*, the payments amounted to 10,251*l.* 7*s.* 7*d.*, leaving a balance of 1,703*l.* 7*s.* 10*d.* in hand and at the bank on the 1st April 1892, as against 3,101*l.* 1*s.* 2*d.* on the 1st April 1891. The reduction in the balance and the increase in expenditure are mainly due to the payment of a sum of 1,660*l.* on account of the purchase of the lease of the new observatory at Valencia and work done on the building.

Resolved—That the results of the records of the self-registering observatories for the last half of 1891, contained in the tabular statement, be communicated to the managers of the observatories in accordance with an original practice of the Office.

Submitted the following statement of accounts :—

|                                            | £     | s. | d. |
|--------------------------------------------|-------|----|----|
| Cash balance on 14th June - - -            | 2,766 | 15 | 1  |
| Receipts from 15th to 28th June - - -      | 27    | 16 | 4  |
|                                            | 2,794 | 11 | 5  |
| Cheques drawn from 15th to 28th June - - - | 163   | 9  | 1  |
|                                            | 2,631 | 2  | 4  |
| Balance on 28th June - - -                 |       |    |    |

Submitted—The following list of publications which had been received since the last meeting :—

*Grenada*.—Meteorological report. 1891.

*Chandler, A.*—Sunshine recording. The instruments and their uses.

*Washington, Weather Bureau*.—Wreck chart of the Great Lakes showing the location of wrecks occasioned through foundering, gales of wind, fogs and general stormy weather conditions from 1886 to 1891.

*Coimbra, Observatorio Meteorologico e Magnetico*.—Observações meteorologicas e magneticas. 1891.

*Falmouth, Royal Cornwall Polytechnic Society*.—Annual report. 1891.

*Fox, W. L.*—Meteorological tables for Falmouth and the Scilly Islands, for the year 1891.

63, Victoria Street, July 13, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.  
MR. GALTON.

PROFESSOR DARWIN.  
MR. STONE.

The Secretary was in attendance.

The Minutes of the last meeting (June 29) were read and confirmed.

Submitted—The following memorandum :—

RAINFALL STATIONS, MAPS, &c. OF THE BRITISH ISLANDS.

MEMORANDUM.

1. The Rainfall Maps and Lists of Stations for Ireland and Scotland are ready, and submitted herewith. They show certain of the stations for which complete returns for the 10 years, 1881–90, appear to be available.

2. The Map and List for England and Wales is not quite complete; in its imperfect state, however, it is submitted to-day, together with the rough map first drawn.

3. It will be seen that in some districts the stations are more closely packed than was desired; but I could hardly see how the really important features of rainfall distribution which the figures exhibit for those districts could be at all fairly shown without using as many (or *nearly* as many) as I have plotted.

4. I have inserted stations pretty thickly round the chief city in each county as directed.

5. May I say that the work I have done so far convinces me that the only way in which I can arrive at a *really good* selection of stations will be to plot first on *county* maps (showing positions accurately) all the stations from which the 10 years of records can be obtained, then to transfer these (or the bulk of them) to a general map, and from *this* to make the final selection?

The material available is so scattered, is derived from so many sources, is so badly arranged, and is so complex, that nothing but this will ensure the production of trustworthy results. I have adhered pretty closely to this in preparing the maps submitted, but think it would repay the Council for the trouble if it were still more strictly followed out—for *England*, at all events.

(Signed) FREDC. GASTER.

B. H. Scott, Esq.

The memorandum was approved. The work to be carried on as proposed, and re-submitted to the Council.

Mr. Scott reported that he had been requested (Letter 1243) to give evidence before the Royal Commission on the Electrical Communication with Lighthouses, &c.—He was authorised to attend as requested.

Read—Letter 1344, from Mr. Galton, as to Mr. Dines's proposed anemometer (Minutes, p. 21). After some discussion it was resolved to request Mr. Dines to ascertain the probable cost of the apparatus (P.C. 1354), with the view of the construction of an instrument for the Office.

Read—A letter from Mr. Bushell (No. 1292), stating that the meteorological publications of the Bidston Observatory would be continued (Minutes, p. 21).

Read—A memorandum stating that since last meeting seven logs had been received, four of them being "excellent." Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Mr. Scott reported it had come to his knowledge that C. Pycock had been guilty of gross misconduct, but not when actually on duty, and that he had suspended him from the 5th instant.—This action was approved.

Letter 1334, from Pycock, was read, and also a memorandum from Mr. Gaster, and Mr. Scott was authorised to allow Pycock to return; his wages to be reduced 2s. 6d. per week, and he to be informed that any recurrence of misconduct would entail immediate dismissal (P.C. 1357).

Submitted—The following report on the 8.30 p.m. forecasts for June 1892:—

The letters used have the following signification:—

a = complete success.

b = partial (i.e., more than half) success.

c = partial failure.

d = total failure.

JUNE 1892.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 33            | 40       | 37                   | 77                                   |
| "                | b | 37            | 43       | 40                   |                                      |
| "                | c | 23            | 7        | 15                   |                                      |
| "                | d | 7             | 10       | 8                    |                                      |
| SCOTLAND, E.     | a | 30            | 53       | 42                   | 85                                   |
| "                | b | 53            | 33       | 43                   |                                      |
| "                | c | 10            | 7        | 8                    |                                      |
| "                | d | 7             | 7        | 7                    |                                      |
| ENGLAND, N.E.    | a | 47            | 60       | 54                   | 79                                   |
| "                | b | 20            | 30       | 25                   |                                      |
| "                | c | 27            | 7        | 17                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| ENGLAND, E.      | a | 37            | 53       | 45                   | 82                                   |
| "                | b | 40            | 33       | 37                   |                                      |
| "                | c | 17            | 7        | 12                   |                                      |
| "                | d | 6             | 7        | 6                    |                                      |
| MIDLAND COUNTIES | a | 47            | 60       | 54                   | 75                                   |
| "                | b | 23            | 20       | 21                   |                                      |
| "                | c | 23            | 13       | 18                   |                                      |
| "                | d | 7             | 7        | 7                    |                                      |
| ENGLAND, S.      | a | 44            | 63       | 54                   | 80                                   |
| "                | b | 33            | 20       | 26                   |                                      |
| "                | c | 20            | 10       | 15                   |                                      |
| "                | d | 3             | 7        | 5                    |                                      |
| SCOTLAND, W.     | a | 37            | 33       | 35                   | 65                                   |
| "                | b | 27            | 33       | 30                   |                                      |
| "                | c | 30            | 24       | 27                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| ENGLAND, N.W.    | a | 53            | 40       | 47                   | 73                                   |
| "                | b | 20            | 33       | 26                   |                                      |
| "                | c | 20            | 27       | 24                   |                                      |
| "                | d | 7             | 0        | 3                    |                                      |
| ENGLAND S.W.     | a | 53            | 30       | 42                   | 73                                   |
| "                | b | 23            | 40       | 31                   |                                      |
| "                | c | 7             | 23       | 15                   |                                      |
| "                | d | 17            | 7        | 12                   |                                      |
| IRELAND, N.      | a | 53            | 40       | 47                   | 73                                   |
| "                | b | 20            | 33       | 26                   |                                      |
| "                | c | 10            | 24       | 17                   |                                      |
| "                | d | 17            | 3        | 10                   |                                      |
| IRELAND, S.      | a | 37            | 44       | 41                   | 81                                   |
| "                | b | 47            | 33       | 40                   |                                      |
| "                | c | 13            | 20       | 16                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 43            | 47       | 45                   | 77                                   |
| "                | b | 31            | 32       | 32                   |                                      |
| "                | c | 18            | 15       | 16                   |                                      |
| "                | d | 8             | 6        | 7                    |                                      |

Submitted—The following reports of work during the month of June 1892 :—

MARINE BRANCH.

July 13, 1892.

Examined 15 new logs.

Discussion of the district between the Cape of Good Hope and New Zealand. Obtaining wind, barometer, and air and sea temperature results.

Charting currents from the logs of men-of-war; observations obtained from the logs of the Orient Steam Navigation Company; and information supplied by the Meteorological Institute of the Netherlands, consisting of extracts from the logs of Dutch and Swedish ships in the Pacific Ocean.

Copying for the Hydrographic Office Dr. Gunn's account of the Futuna cyclone of February last; also the report of Captain E. H. Andrew, of the ship "Cromdale," on a large ice-field, fallen in with in the South Atlantic at the beginning of April.

(Signed) CHAS. HARDING.

The Marine Superintendent.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To June 30, 1892.)

*Weekly Weather Report* :—

1891.—All numbers, Appendices, and Supplements, with title-page printed and issued.—Complete.

1892.—All numbers issued to date. *Appendix I*, Part 2, nearly ready for printer; *Supplement*, Summary for January, issued.

*Daily Weather Report*, 1892.—All numbers issued promptly to date. Monthly Correction and Addition Sheets issued up to that for May.

*Primary Checking of Storm Warnings Issued*, 1892.—Done to date.

*Checking of Daily (8.30 p.m.) Forecasts Issued*, 1892.—Done to date.

*Plotting of Rainfall Stations*.—Still in hand. Interim report handed in, with rough maps.

*Re-tabulating Observations of Fog for 1876 and 1877*.—In hand by Mr. Brodie.

*Preparation of Lustra-Values (Monthly) for Rain, Temperature, and Sunshine at Daily and Weekly Weather Report Stations*; giving Authorities for all information used, &c.—In hand, and well advanced.

Some of the staff are now taking portions of their summer vacation.

(Signed) FREDC. GASTER.

Telegraphic Branch,

July 13, 1892.

PANTAGRAPH ROOM.

July 1, 1892.

*Hourly Means*.—Some advance has been made with the proof of "Hourly Means" for 1889; but the sheets still come very slowly from the printer.

The Tables of Means for 1890 are still in hand, and are progressing satisfactorily.

The sunshine records from Bunhill Row for the first six months of the year have been tabulated for the Royal Meteorological Society.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

July 1, 1892.

*Examinations.*

*January and February*, 1892.—Completed.

*March and April*.—Partial.

*May*.—Partial examination of the Valencia work for the Registrar-General of Ireland.

Weekly examination (on receipt) of curves and documents from all observatories.

*Reports.*

*July to December 1891*.—Reports on the work for each month, and combined report for Council.

*Miscellaneous.*

Revising Form No. 47 (Rain-gauge Papers) and correcting proofs (three), &c.

Measurements re the determination of the Valencia barograph and thermograph scale and zero-line values; also the determination of corrections for the wet and dry-bulb hourly values, April-June 1892.

General routine work.

(Signed) T. E. ALLEN.

| LIABILITIES.                               |   |   |   | ASSETS. |    |    |                  |   |   |   |        |    |    |
|--------------------------------------------|---|---|---|---------|----|----|------------------|---|---|---|--------|----|----|
| To Council                                 | - | - | - | £       | s. | d. | By cash at Bank  | - | - | - | £      | s. | d. |
|                                            |   |   |   | 250     | 0  | 0  |                  |   |   |   | 1,278  | 5  | 9  |
| „ outstanding accounts or work uncompleted | - | - | - | 181     | 18 | 3  | „ „ at Office    | - | - | - | 85     | 9  | 3  |
| „ Post Office (estimated)                  | - | - | - | 274     | 16 | 10 | „ H.M. Exchequer | - | - | - | 325    | 0  | 0  |
| „ sundry creditors                         | - | - | - | 265     | 16 | 4  | „ sundry debtors | - | - | - | 365    | 3  | 11 |
| „ balance                                  | - | - | - | 1,081   | 7  | 6  |                  |   |   |   |        |    |    |
|                                            |   |   |   | £2,053  | 18 | 11 |                  |   |   |   | £2,053 | 18 | 11 |

\* Some expenses under this head not yet brought to account.

**Submitted**—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

# 1. WARNINGS ISSUED.

## SUMMARY.

|                    |   |   |   |   |               |
|--------------------|---|---|---|---|---------------|
| A + B (successful) | - | - | - | = | 16 districts. |
| C (failures)       | - | - | - | = | 2 districts.  |

# 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
July 13, 1892.

**Submitted**—The following statement of accounts :—

|                                      | £     | s. | d. |
|--------------------------------------|-------|----|----|
| Cash balance on 28th June -          | 2,631 | 2  | 4  |
| Receipts from 29th June to 13th July | 3,515 | 19 | 2  |
|                                      | 6,147 | 1  | 6  |
| Cheques drawn „ „                    | 1,421 | 16 | 10 |
| Balance on 13th July                 | 4,725 | 4  | 8  |

**Submitted**—The following list of publications which had been received since the last meeting :—

- Washington, Weather Bureau.*—Report of the Chief of the Weather Bureau for 1891.  
 — Notes on the climate and meteorology of Death Valley, California.  
 — *War Department.*—Letter from the Acting Secretary of War, . . . transmitting a report of the Chief Signal Officer of the Army on the climatic conditions of the State of Texas.  
 — Report of the Secretary of War . . . . . Vol. iv. [Containing Report of the Chief Signal Officer for the year ending June 30, 1891.]  
*Mauritius, Royal Alfred Observatory.*—Meteorological results for 1890.  
*Cambridge (Mass.), New England Meteorological Society.*—Investigations of the New England Meteorological Society for the year 1890.  
*Warsaw, Oddzial Warszawski Towarzystwa popierania Przemyslu i Handlu.*—Spostrzezenia meteorologiczne. 1890.  
*Halle, Kaiserliche leopoldino-carolinische deutsche Akademie der Naturforscher.*—Leopoldina. Heft xxvii. 1891.  
*Binnie, A. R.*—On mean or average annual rainfall, and the fluctuations to which it is subject.  
*Boedl, W.*—Temperaturmittel für Bayern, 1881–90.  
 — Die Schneedecke in Bayern im Winter, 1890–91.  
*Tillmann, C.*—Beobachtungen über Gewitter in Bayern, Württemberg, Baden und Hohenzollern während des Jahres 1891.  
*Lang, C.*—Die Fortpflanzungsgeschwindigkeit der Gewitter in Süddeutschland während des Jahres 1891.  
*Erk, F.*—Eine Windhose zwischen Gewitterwolken.  
*Lingg, F.*—Meteore und Erdbeben im Jahre 1891.  
*Carlsruhe, Centralbureau für Meteorologie und Hydrographie.*—Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogthum Baden. 1891.

63, Victoria Street, July 27, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.

MR. STONE.

PROFESSOR DARWIN.

The Secretary was in attendance.

The Minutes of the last meeting (July 13) were read and confirmed.

Mr. Scott stated that on the 18th instant he had received a letter (No. 1368) stating that there would be risk to the electrograph at Kew during the progress of some alterations to the building, and that he had authorised the dismounting of the apparatus (P.C. 1390).—Approved.

Read—Letter 1406 as to the charges made for repair of the Revenue House at Valencia, used formerly for the observatory. The matter was referred to the Chairman.

Mr. Scott reported that on the 21st instant he had been examined before the Lighthouse Communication Committee (Minutes, July 13).

Read—Letter 1387, stating that the estimated cost of Mr. Dines' recording pressure tube anemometer would be 23%. It was resolved that the apparatus be ordered (P.C. 1446).

Submitted—The following correspondence, which was approved :—

(M.O. 1400.)

SIR,

Lloyd's, E.C., July 22, 1892.

I AM instructed to inform you that Mr. Higham has brought under the notice of my Committee an anemometer for showing the direction and pressure of the wind, which he has elaborated in company with Mr. W. H. Dines, Fellow of the Meteorological Society.

My Committee are not averse to placing some anemometers at some of Lloyd's Signal Stations, provided that observations showing the direction and pressure of the wind may be generally useful.

I should be much obliged to you if you would be so good as to inform me whether you consider that the record of such observations would be of practical benefit.

I am, &c.

(Signed) EDWARD PUTTOCK,  
For the Secretary.

The Secretary,  
Meteorological Office, 63, Victoria Street, S.W.

(P.C. 1421.)

Meteorological Office,

London, July 25, 1892.

SIR,

THE Council do not know Mr. Higham, but Mr. Dines has been for some months carrying on experiments for them.

They have not yet ordered one of the new instruments to be constructed, but I may say that it is very probable they will do so ere long.

I should not advise Lloyd's to order the instrument until some experience has been gained of its working.

I shall not fail to let you know as soon as we have anything to communicate, say in the course of the coming winter.

Observations from Lloyd's stations would probably be of considerable value.

I am, &c.

(Signed) ROBERT H. SCOTT,  
Secretary.

The Secretary,  
Lloyd's, E.C.

Mr. Scott submitted a series of chromo-lithographs prepared by Mr. Kennedy representing sunset skies, with forecasts based upon them. The Council decided not to purchase a copy.

Read—A letter from Mr. Baillie, stating that since last meeting one log had been received, which was "excellent." Mr. Scott was instructed to convey the marked thanks of the Council to the observer.

**Submitted**—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

**1. WARNINGS ISSUED.**

|                    |   |   |   |   |   |               |
|--------------------|---|---|---|---|---|---------------|
| A + B (successful) | - | - | - | - | = | 13 districts. |
| C (failures)       | - | - | - | - | = | 1 district.   |

**2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.**

None.

(Signed) **FREDC. GASTER.**

Telegraphic Branch,  
July 27, 1892.

**Submitted**—The following statement of accounts :—

|                                 | £      | s. | d. |
|---------------------------------|--------|----|----|
| Cash balance on 13th July       | -      | -  | -  |
| Receipts from 13th to 26th July | -      | -  | -  |
|                                 | 4,725  | 4  | 8  |
|                                 | 12     | 16 | 7* |
|                                 | 4,738  | 1  | 3  |
| Cheques drawn 13th to 26th July | -      | -  | -  |
|                                 | 278    | 7  | 11 |
| Balance on 26th July            | -      | -  | -  |
|                                 | £4,459 | 13 | 4* |

\* Exclusive of a draft on Brussels lodged on 14th July not yet debited in Pass-book.

**Submitted**—The following list of publications which had been received since the last meeting :—

- Lorenz-Liburnau, J. Ritter von.*—Resultate forstlich-meteorologischen Beobachtungen insbesondere in den Jahren 1885–87. II. Theil.
- Adams, W. G.*—Comparison of simultaneous magnetic disturbances at several observatories.
- Yale Observatory.*—Report for the year 1891–92.
- Lang, C.*—Bericht über die Thätigkeit der kgl. bayerischen meteorologischen Centralstation und der ihr angeschlossenen Stationen im Jahre 1891.
- Schreiber, P.*—Untersuchung über das Wesen der sogenannten Bessel'schen Formel sowie deren Anwendung auf die tägliche periodische Veränderung der Lufttemperatur.
- Oxford, Radcliffe Observatory.*—Results of meteorological observations. 1887.
- Dulier, E. E.*—A natural process of dissolution for smoke and fogs.
- Dove, K.*—Niederschlagsmengen am Kap der Guten Hoffnung.
- Manson, M.*—Circulation of the atmosphere of planets, with discussion.
- London, Army Medical Department.*—Report for the year 1890.
- Schreiber, P.*—Der Siebenschläfer und die durchschnittlichen Regenverhältnisse im Königreich Sachsen.
- Greenwich, Royal Observatory.*—Report of the Astronomer Royal to the Board of Visitors. 1892.
- Munich.*—Bericht über die Verhandlungen der internationalen Conferenz der Repräsentanten der meteorologischen Dienste aller Länder zu München. 1891.

63, Victoria Street, October 19, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.

|

PROFESSOR DARWIN.

MR. GALTON.

|

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (July 27) were read and confirmed.

Mr. Scott reported that on his recent visit to Valencia he had met the sub-agent to the Knight of Kerry, and had made an offer to him to settle the question of the dilapidations at the Revenue House, the late observatory at Valencia (Minutes, July 27). This offer had not been accepted.

Mr. Scott was instructed to forward the following letter :—

(M.O. 1865.)

DEAR SIR,

WITH reference to your letter to me of the 6th instant, and to my visits to the island on the 12th, I am instructed by the Council to offer you the sum of 50*l*. in full discharge of any claims on them for dilapidations at the Revenue House.

If you are not prepared to accept this, I am instructed to propose that the matter should be settled by reference to an arbitrator; and if the County Surveyor of Kerry, Mr. Goodwin, is willing to act in that capacity, the Meteorological Council will be prepared to abide by his decision. The costs of the arbitration should be shared equally by the Knight and the Council.

Submitted—The following Reports :—

## REPORT OF INSPECTION OF SCOTTISH STATIONS for 1892.

## BAROMETERS.

The comparison of these instruments was made with inspector's standard barometer No. 690 which I have reason to believe remained correct during the tour of inspection. The barometer at Braemar was found to read about half a tenth inch too low. The instrument was rectified, and read thereafter the same as the standard. The barometers at the other stations were in good order, and at all stations the readings were very accurately made, and reduced correctly where it is the practice of the observer to reduce his observations. The following table gives the readings of the standard barometer alongside the station barometers :—

TABLE I.

| STATIONS.                   | Inspector's<br>Standard<br>Barometer<br>No. 690<br>corrected. | Reporting<br>Barometer<br>uncorrected. | Check<br>Barometer<br>uncorrected. | REMARKS.                               |
|-----------------------------|---------------------------------------------------------------|----------------------------------------|------------------------------------|----------------------------------------|
|                             | Inches.                                                       | Inches.                                | Inches.                            |                                        |
| Fort William -              | 29·820                                                        | 29·818                                 | —                                  | Check barometer is higher up in house. |
| Fort Augustus -             | 29·842                                                        | 29·826                                 | —                                  |                                        |
| Lairg -                     | 29·585                                                        | 29·570                                 | —                                  |                                        |
| Dunrobin -                  | 29·860                                                        | 29·863                                 | —                                  |                                        |
| Wick -                      | 29·810                                                        | 29·808                                 | 29·750                             |                                        |
| Deerness -                  | 29·378                                                        | 29·370                                 | —                                  |                                        |
| Dunrossness -               | 29·582                                                        | 29·570                                 | 29·580                             |                                        |
| Aberdeen -                  | 29·284                                                        | 29·284                                 | 29·282                             |                                        |
| Braemar -                   | 28·303                                                        | 28·303                                 | —                                  |                                        |
| Gordon Castle -             | 29·486                                                        | 29·492                                 | —                                  |                                        |
| Stornoway -                 | 30·077                                                        | 30·080                                 | 30·070                             |                                        |
| Glencarron -                | 29·558                                                        | 29·561                                 | —                                  |                                        |
| Nairn -                     | 29·793*                                                       | 29·786                                 | 29·790                             |                                        |
| Lednathie -                 | 29·213                                                        | 29·212                                 | —                                  |                                        |
| Dundee -                    | 29·734                                                        | 29·730                                 | —                                  |                                        |
| Marchmont -                 | 29·156                                                        | 29·160                                 | —                                  |                                        |
| Ladylaw -                   | 29·152                                                        | 29·154                                 | —                                  |                                        |
| Wolfelee -                  | 28·610                                                        | 28·608                                 | —                                  |                                        |
| Ardrossan -                 | 29·262                                                        | 29·252                                 | —                                  |                                        |
| Glasgow Observ-<br>vatory - | 29·108                                                        | 29·108                                 | —                                  |                                        |
| Leith -                     | 30·127                                                        | 30·128                                 | 30·131                             |                                        |
| Rosewell -                  | 29·408                                                        | 29·398                                 | —                                  |                                        |

## THERMOMETERS.

These were all compared with standard thermometer No. 4433, and the results are detailed in Table II., which shows the readings of the standard and the errors of the different instruments ascertained by the comparison. The following minimum thermometers were found out of order:—At Gordon Castle  $0^{\circ} \cdot 6$  of spirit was lodged at the very top of the tube; this was put right, and the observer was shown the method of doing it when the quantity evaporated is small. At Rosewell,  $4^{\circ} \cdot 0$  was lodged near the top of the top, which the observer, under direction, put right; and he was very specially shown the long time required till the whole of the spirit is drained down to the column of spirit.

TABLE II.

| STATIONS.                  | Standard<br>No. 4433<br>cor-<br>rected. | Dry<br>Bulb.         | Wet<br>Bulb.         | Spare<br>Thermo-<br>meter. | Max.<br>Thermo-<br>meter. | Min.<br>Thermo-<br>meter. | Time<br>in Water. | Change<br>of<br>Tempera-<br>ture. | REMARKS.                                   |
|----------------------------|-----------------------------------------|----------------------|----------------------|----------------------------|---------------------------|---------------------------|-------------------|-----------------------------------|--------------------------------------------|
| Fort William -             | $60^{\circ} \cdot 0$                    | $+0^{\circ} \cdot 1$ | $+0^{\circ} \cdot 1$ | —                          | $0^{\circ} \cdot 0$       | $0^{\circ} \cdot 0$       | 90                | Uniform.                          |                                            |
| Fort Augustus -            | $56^{\circ} \cdot 5$                    | $+0^{\circ} \cdot 1$ | $+0^{\circ} \cdot 1$ | —                          | $+0^{\circ} \cdot 2$      | $-0^{\circ} \cdot 4$      | 90                | Do.                               |                                            |
| Lairg -                    | $62^{\circ} \cdot 7$                    | $+0^{\circ} \cdot 1$ | $+0^{\circ} \cdot 2$ | —                          | $-0^{\circ} \cdot 3$      | $0^{\circ} \cdot 0$       | 90                | $+0^{\circ} \cdot 3$              |                                            |
| Dunrobin -                 | $61^{\circ} \cdot 9$                    | $-0^{\circ} \cdot 6$ | $-0^{\circ} \cdot 6$ | —                          | $-0^{\circ} \cdot 1$      | $-0^{\circ} \cdot 4$      | 135               | $+0^{\circ} \cdot 5$              |                                            |
| Wick -                     | $58^{\circ} \cdot 8$                    | $+0^{\circ} \cdot 4$ | $+0^{\circ} \cdot 5$ | —                          | $0^{\circ} \cdot 0$       | $+0^{\circ} \cdot 1$      | 75                | Uniform.                          |                                            |
| Deerness -                 | $58^{\circ} \cdot 7$                    | $+0^{\circ} \cdot 1$ | $0^{\circ} \cdot 0$  | —                          | $-0^{\circ} \cdot 8$      | $-0^{\circ} \cdot 1$      | 90                | $+0^{\circ} \cdot 3$              |                                            |
| Dunrossness -              | $55^{\circ} \cdot 3$                    | $+0^{\circ} \cdot 5$ | $+0^{\circ} \cdot 5$ | $+0^{\circ} \cdot 2$       | $0^{\circ} \cdot 0$       | $0^{\circ} \cdot 0$       | 150               | $-0^{\circ} \cdot 4$              |                                            |
| Aberdeen -                 | $55^{\circ} \cdot 7$                    | $+0^{\circ} \cdot 3$ | $+0^{\circ} \cdot 3$ | —                          | $+0^{\circ} \cdot 3$      | $+0^{\circ} \cdot 1$      | } 80              | Uniform.                          |                                            |
| Do. Observatory            | $55^{\circ} \cdot 7$                    | —                    | —                    | —                          | $-0^{\circ} \cdot 3$      | $-0^{\circ} \cdot 3$      |                   | Do.                               |                                            |
| Braemar -                  | $54^{\circ} \cdot 2$                    | $+0^{\circ} \cdot 3$ | $+0^{\circ} \cdot 4$ | —                          | $-0^{\circ} \cdot 1$      | $-0^{\circ} \cdot 2$      | 95                | Do.                               |                                            |
| Gordon Castle -            | $55^{\circ} \cdot 8$                    | $+0^{\circ} \cdot 2$ | $+0^{\circ} \cdot 1$ | —                          | $+0^{\circ} \cdot 2$      | $0^{\circ} \cdot 0$       | 75                | Do.                               | Min. was $0^{\circ} \cdot 6$ out of order. |
| Stornoway -                | $54^{\circ} \cdot 1$                    | $+0^{\circ} \cdot 5$ | $+0^{\circ} \cdot 5$ | —                          | $-0^{\circ} \cdot 4$      | $-0^{\circ} \cdot 6$      | 120               | $+0^{\circ} \cdot 5$              |                                            |
| Glencarron -               | $53^{\circ} \cdot 0$                    | $0^{\circ} \cdot 0$  | $-0^{\circ} \cdot 1$ | —                          | $-0^{\circ} \cdot 2$      | $-0^{\circ} \cdot 2$      | 130               | $+0^{\circ} \cdot 7$              |                                            |
| Nairn -                    | $55^{\circ} \cdot 0$                    | $+0^{\circ} \cdot 7$ | $+0^{\circ} \cdot 7$ | —                          | $0^{\circ} \cdot 0$       | $-0^{\circ} \cdot 2$      | 65                | $+0^{\circ} \cdot 2$              |                                            |
| Lednathie -                | $55^{\circ} \cdot 3$                    | $+0^{\circ} \cdot 2$ | $+0^{\circ} \cdot 1$ | —                          | $+0^{\circ} \cdot 3$      | $-0^{\circ} \cdot 2$      | 120               | $+0^{\circ} \cdot 7$              |                                            |
| Dundee -                   | $54^{\circ} \cdot 6$                    | $+0^{\circ} \cdot 4$ | $+0^{\circ} \cdot 3$ | —                          | $+1^{\circ} \cdot 3$      | $-0^{\circ} \cdot 3$      | 65                | Uniform.                          |                                            |
| Marchmont -                | $52^{\circ} \cdot 0$                    | $0^{\circ} \cdot 0$  | $-0^{\circ} \cdot 1$ | —                          | $0^{\circ} \cdot 0$       | $0^{\circ} \cdot 0$       | 240               | $+0^{\circ} \cdot 5$              |                                            |
| Ladylaw -                  | $56^{\circ} \cdot 2$                    | $0^{\circ} \cdot 0$  | $0^{\circ} \cdot 0$  | —                          | $-0^{\circ} \cdot 2$      | $0^{\circ} \cdot 0$       | 75                | $+0^{\circ} \cdot 3$              |                                            |
| Wolfelee -                 | $51^{\circ} \cdot 5$                    | $-0^{\circ} \cdot 2$ | $-0^{\circ} \cdot 3$ | —                          | $+0^{\circ} \cdot 1$      | $-1^{\circ} \cdot 1$      | 150               | $-0^{\circ} \cdot 4$              |                                            |
| Ardrossan -                | $49^{\circ} \cdot 5$                    | $+0^{\circ} \cdot 1$ | $+0^{\circ} \cdot 2$ | —                          | $-0^{\circ} \cdot 3$      | $-0^{\circ} \cdot 3$      | 140               | Uniform.                          |                                            |
| Glasgow Obser-<br>vatory - | $47^{\circ} \cdot 9$                    | —                    | —                    | —                          | $0^{\circ} \cdot 0$       | $0^{\circ} \cdot 0$       | 200               | Do.                               |                                            |
| Leith -                    | $50^{\circ} \cdot 1$                    | $0^{\circ} \cdot 0$  | $+0^{\circ} \cdot 2$ | —                          | $0^{\circ} \cdot 0$       | $-0^{\circ} \cdot 4$      | 60                | Do.                               |                                            |
| Rosewell -                 | $54^{\circ} \cdot 0$                    | $-0^{\circ} \cdot 2$ | $-0^{\circ} \cdot 2$ | —                          | $+0^{\circ} \cdot 3$      | $-0^{\circ} \cdot 4$      | 80                | Do.                               | Min. was $4^{\circ} \cdot 0$ out of order. |

## HYGROMETERS.

At Stornoway, on opening the screen, the difference between the dry and wet bulbs was only  $0^{\circ} \cdot 8$ , though at the time the weather was fine and the air dry. The wet-bulb was plainly out of order. A fresh piece of muslin was put on, and the hygrometer placed in the screen and read again after some time with a resulting difference of  $5^{\circ} \cdot 8$ , between the dry and wet-bulb readings. The observer was shown how to keep the instrument in better order. At all other stations the wet-bulbs were well-mounted and in good order. During the excessively damp atmosphere of October 3rd and 4th, differences of only  $0^{\circ} \cdot 3$  between the dry and wet bulbs were noted at Hawick and Marchmont.

## OTHER INSTRUMENTS.

At Ardrossan it was necessary, as leaking had commenced, to order the receiver to be re-bottomed; and, owing to the erection of new buildings, to change somewhat the positions of the sunshine recorders at Stornoway and Fort William. These instruments were in good order at all stations.

*Fort William, August 19th.*—The thermometer screen of the observatory was repainted in the end of June, and the Stevenson screen is ordered to be repainted. The Beckley rain-gauge now works well, and the differences between the two rain-gauges are very slight. As there is a difference for the year 1891 of about 9 inches between the annual amounts of the rainfall at the observatory and the schoolhouse (the old rain-gauge of station), it has been proposed to place another gauge in the grounds, with the view of seeing if the difference be due to the degree of proximity to the rising ground behind the houses in this part of Fort William. The building of a house on the ground adjoining has necessitated the removal of the sunshine recorder to a new position reached by the sun at all hours when above the visible horizon. The instruments are in excellent order, and the observations are made punctually and accurately.

*Fort Augustus, August 20.*—The instruments are all in good order. The Rev. A. W. Blundell and assistant were both from home at the time of my visit, Father Martin, the previous observer, being in temporary charge.

*Lairg*, August 22nd.—All the instruments are in admirable order, and are well observed.

*Dunrobin*, August 23rd.—The instruments are in good order, and the observations are made carefully and intelligently.

*Wick*, August 24th.—The minimum thermometer is in good order, and a new maximum was supplied to replace the one broken when the screen was blown down during a heavy gale. The garden having been considerably enlarged, the rain-gauge and Stevenson's screen have been removed to good and more open positions, the screen, a new one, being finished in a good workmanlike manner. Since last year's inspection the porcelain of the wet-bulb thermometer was broken at the upper screw and repaired at the time, so that the porcelain scale from which the readings are taken read  $2^{\circ} \cdot 8$  too high; and as thereafter the observer subtracted only  $2^{\circ} \cdot 0$  from each reading, these wet-bulb readings have been nearly a degree too high. Mr. Sinclair observes with great intelligence and care, and in future particular attention will be given to report extreme wind-force in gales.

*Deerness*, August 26th.—The maximum thermometer in use since the instruments were transferred to this station from Stennis reads  $0^{\circ} \cdot 8$  too low. The thermometer, sunshine-recorder, and other instruments are particularly well attended to, and the observations are read expertly and correctly.

*Dunrossness*, August 30th.—In the absence of the Rev. W. Brand in Fair Isle, Mrs. Brand was in charge, who made all the observations with remarkable care and correctness, and the instruments, including the minimum thermometer, were all in excellent order. A Richard's barograph was added to the outfit of the station.

*Aberdeen*, September 2nd.—Every thing as respects instruments and observations are in excellent condition, leaving, indeed, nothing to be desired.

*Braemar*, September 1st.—As had been suspected, the barometer was  $0 \cdot 050$  inch too low; but after inversion and tapping, a second reading was taken, which agreed with standard No. 690 I carry with me. All the other instruments are in very good order, and the observations are made with much care and intelligence.

*Gordon Castle*, September 3rd.—A new maximum thermometer was added in November 1891, to replace the old one, a Phillips, whose index had been lost. About  $0^{\circ} \cdot 6$  of spirit at the top of the minimum tube was dislodged and the instrument put right, the observer being shown the way when the evaporated portion is small and at the very top of the tube. The instruments are otherwise in good order and the observations made with intelligence and accuracy.

*Stornoway*, September 6th.—On opening the thermometer screen, the dry-bulb read  $59^{\circ} \cdot 6$  and the wet  $58^{\circ} \cdot 8$ , the muslin being almost dry. After being properly wetted sometime after and exposed in the screen (closed) the readings were  $58^{\circ} \cdot 8$  and  $53^{\circ} \cdot 0$ . Instructions were given as to obviating the recurrence of such faulty readings in future. The sunshine recorder was ordered to be raised 6 feet owing to the additions which have just been made to the school buildings. Otherwise the instruments are in very good order, and much care and intelligence shown in making the observations.

*Glencarron*, September 8th.—The instruments continue to be in excellent order and are well attended to. The small barograph, thermograph, and hygrograph were all in good working order.

*Nairn*, September 9th.—The Stevenson screen was ordered to be repainted, and furnished with new hinges and ventilator. Otherwise the instruments are in very good order; and much care is evidently taken by Miss Penny, her sister and brother, who assist, in securing uniformity in the methods of making the observations.

*Lednathie*, September 10th.—Since last inspection a H.C. anemometer has been added to this station. Mr. Morrison keeps the instruments in admirable order, and evinces much care and shrewd observation in carrying on the work.

*Dundee*, September 12th.—The instruments are all in good order, and the observations continue to be made with accuracy and intelligence.

*Marchmont*, October 3rd.—The instruments continue to be kept in very good order, and great intelligence is manifested in carrying on the observations.

*Ladylaw, Hawick*, October 4th.—The instruments and observations leave nothing to be desired, much enthusiasm and great labour in reducing the observations being manifested by Mr. Wilson.

*Wolflee*, October 5th.—The instruments are in good order, and the observer is particularly careful and intelligent.

*Ardrrossan*, October 6th.—The receiver of the rain-gauge was ordered to be repaired. The station is presently in charge of Mr. J. Scott, assistant, owing to the serious illness of the chief observer. Mr. S. observes with care and correctness.

*Glasgow Observatory*, October 7th.—New tubes have been fitted to the thermograph to replace the old ones which had been broken. Everything was in excellent order and working well, and the observations are made with much care and correctness.

*Clober*, October 7th.—The observations at this station are at present in abeyance owing to the state of Mr. Bertram's health, which obliged him to leave Clober for the Continent in the beginning of the year.

*Leith*, October 11th.—The Stevenson screen and the railing round the outdoor instruments were ordered to be repaired; but everything else is in good order, and the new observer is attentive and accurate in what he does.

*Rosewell*, October 14th.—Nearly  $4^{\circ} \cdot 0$  of spirit was lodged near the top of the tube of the minimum thermometer which had recently got out of order. Under my direction the observer put it right. With this exception the instruments are all in good order; and the observer is greatly interested in the work, which he does carefully, correctly, and with more than usual fulness.

(Signed) ALEXANDER BUCHAN.

#### REPORT of INSPECTION of the IRISH and WELSH STATIONS, 1892.

I have to report that I have completed the inspection of all the Irish stations, and of the Welsh ones, except Llandovery. The time occupied has been five weeks. The table of thermometer corrections is appended to the report.

#### TELEGRAPHIC STATIONS.

*Holyhead*, visited September 15th.—The station is in good order, but the shrubs about the rain-gauge have been allowed to grow too high. It is not improbable that there may be a change of observer at this station.

*Donaghadee*, visited September 19th.—At this station the instruments were all in good order. The observer's health has failed, and the observations are now taken, in bad weather, by his brother, who was at one time the regular reporter.

*Malin Head*, visited September 23rd.—I found this station in good order. The observer is very intelligent.

*Mullaghmore*, visited September 26th.—I deposited at this station the self-recording aneroid as authorised by the Council (Minutes, p. 20). The instruments were in good order.

*Belmullet*, visited September 28th.—At this station I found that the vane recently erected had been set to magnetic bearings, and this I had set right. The instruments were otherwise in good order. The observer's brother, who had formerly been the assistant, had left the place; a younger sister had taken his place.

*Parsonstown*, visited October 4th.—The observer here had been changed, and the present reporter is named William James Perry. He is a National school teacher, well educated, and careful. His absence from the observatory during school hours is a serious inconvenience, but I cannot see how this can be obviated.

*Roche's Point*, visited October 7th.—This station calls for no remark. The instruments were all in good order. The barometers have been placed in a much better light than formerly.

*Valencia Observatory*, visited October 11th.—At this station the instruments were all in good order. The Stevenson screen had fallen to pieces, and a new one has been ordered to replace it. I find that the hill opposite interferes with the sunshine for an hour or two in the mornings, at least in the winter half year. I instructed Mr. Cullum to make a weekly note of the precise duration of sunshine cut off, so that the per-centages for the station might be corrected.

*St. Anne's Head*, visited October 15th.—At this station all was in good order. The observer, Mr. Blake, is likely to leave ere long, on promotion. His successor will be Mr. Knott, and Mr. Blake is instructing him.

#### WEEKLY WEATHER REPORT STATIONS.

*Llandudno*, visited September 14th.—I inspected the sun-shine recorder. Its action is not quite satisfactory, as it received accidental damage at its former position on the Great Orme's Head. I am recalling it for repair, supplying another for use in the interim.

*Londonderry*, visited September 22nd.—At this station the observer had recently procured a maximum thermometer, an instrument which he had not had for some months, since the recall of one lent to him by the Office. Otherwise the instruments were in good order, as before.

*Edenfel, Omagh*, visited September 24th.—This is a new station. Colonel Buchanan, the observer, has a good situation, but the thermometer screen is placed in a corner, out of the way of lawn tennis. The instruments are good and in good order.

*Mount Trenchard*, visited October 5th.—This station was in good order. No other observations than rainfall and extreme temperatures, maximum and minimum, are taken.

*Killarney*, visited October 10th.—This station was in good order as usual.

*Waterford*, visited October 13th.—This station was in good order.

*Kilkenny Castle*, visited October 14th.—This station was also in good order. I am glad to say that the inner can of the rain-gauge has at last been enlarged so as to receive a larger quantity without overflow.

## STATIONS OF THE SECOND ORDER.

*Dublin City*, visited September 16th.—This station was as satisfactory as is possible in a locality so confined as that which it occupies.

*Mountjoy Observatory*, visited September 16th.—This station was in good order. It is the most satisfactory, as to exposure, of all the stations that I visit.

*Glusnevin*, visited September 17th.—This station was in good order. I found a nest of a mason bee inside the rain-gauge. It did not interfere with the tube at the bottom, and had apparently not been there for long.

*Lissan*, visited September 20th.—At this station, which was in good order, the observer had been changed, the gardener, Donaldson, having left.

*Armagh*, visited September 20th.—This station was quite satisfactory. I found that the anemometer hut, which is placed standing loosely on a leaded roof, required to be moved, as a crack had apparently occurred in the lead under it. The hut had been in the same place for 40 years. Dr. Dreyer undertook that the operation should be carried out with the greatest care, so I authorised its being effected.

*Colebrooke*, visited September 21st.—The instruments were in very good order.

*Londonderry*, visited September 22nd.—At this station the exposure is very imperfect, as the bushes in the garden interfere with the rain-gauge. The observations are, however, taken carefully.

*Markree*, visited September 27th.—At this station, which is in very good order, a railing has been put up round the thermometer screen, which is a great improvement on previous arrangements.

*Currygrane, Edgeworthstown*, visited September 30th.—At this station the observer has been changed, and the present youth has not yet got quite experience enough. He is, however, careful and is improving.

*Arley Cottage*, visited October 3rd.—At this station Major Maxwell was absent, but H. Usher, the gardener, was in attendance. It is an exceptional station, being very close to a large sheet of water (Lough Sheelin). The observations are carefully taken.

*Parsonstown*, visited October 4th.—The remarks on this station are given under the head of Telegraphic Stations.

*St. David's*, visited October 17th.—This station was, as usual, in very good order.

In addition to the above stations, I also visited Cardiff, and I hope I have found a gentleman who will act as Agent for the Office at that port.

(Signed) ROBERT H. SCOTT.

Corrections to be applied to the readings of the thermometers :—

| STATIONS. | Dry Bulb. | Wet Bulb. | Max. | Min. | Spare. | REMARKS. |
|-----------|-----------|-----------|------|------|--------|----------|
|-----------|-----------|-----------|------|------|--------|----------|

## TELEGRAPHIC REPORTING STATIONS.

|                        |   |   |      |      |      |      |                 |                                                   |
|------------------------|---|---|------|------|------|------|-----------------|---------------------------------------------------|
| Holyhead               | - | - | 0°0  | -0°2 | -0°5 | +0°2 | -0°5            | Max. and min. thers. both new. —<br><br>.2/ -0.7/ |
| Malin Head             | - | - | -0°2 | -0°2 | 0°0  | -0°9 | -0°7            |                                                   |
| Mullaghmore            | - | - | -0°3 | -0°3 | -0°2 | +0°7 | -0°3            |                                                   |
| Belmullet              | - | - | -0°4 | -0°3 | -0°1 | -0°3 | —               |                                                   |
| Donaghadee             | - | - | -0°4 | -0°4 | +0°4 | -0°1 | <del>+0°5</del> |                                                   |
| Parsonstown            | - | - | -0°7 | +0°1 | -0°6 | +1°1 | —               |                                                   |
| Valencia (Cahirciveen) | - | - | -0°6 | -0°6 | -0°6 | -0°1 | -0°4            |                                                   |
| Roche's Point          | - | - | -0°4 | -0°4 | -0°4 | 0°0  | —               |                                                   |
| St. Ann's Head         | - | - | -0°6 | 0°0  | +0°1 | -0°1 | -0°2            |                                                   |

## WEEKLY WEATHER REPORT STATIONS.

|                 |   |      |      |      |      |   |                               |
|-----------------|---|------|------|------|------|---|-------------------------------|
| Edenfel, Omagh  | - | —    | —    | +0°1 | -0°1 | — | New station for W. W. Report. |
| Kilkenny Castle | - | —    | —    | -0°1 | 0°0  | — |                               |
| Waterford       | - | -0°2 | -0°2 | 0°0  | 0°0  | — |                               |
| Killarney       | - | -0°4 | -0°4 | -0°1 | 0°0  | — |                               |
| Foynes          | - | —    | —    | -0°3 | +0°1 | — |                               |

## STATIONS OF THE SECOND ORDER, 1892.

Corrections to be applied to readings of—

| STATIONS.             | Dry Bulb. | Wet Bulb. | Max. | Min. | Spare Ther. | REMARKS.                                            |
|-----------------------|-----------|-----------|------|------|-------------|-----------------------------------------------------|
| Armagh - -            | -0.4      | -0.5      | -1.3 | 0    | -0.4        | Grass min. +1.0 { Min. therm. of Casella's pattern. |
| Brookeborough -       | -0.6      | -0.9      | -0.4 | -0.1 | —           |                                                     |
| Dublin (City) -       | -0.4      | -0.5      | -0.8 | 0.0  | —           | Do. -0.3.                                           |
| Dublin (Phoenix Park) | -0.5      | -0.6      | -0.3 | +0.1 | —           | Do. 0.0.                                            |
| Edgeworthstown -      | -0.5      | -0.5      | -0.6 | +0.3 | —           | Do. -0.1.                                           |
| Glasnevin - -         | -0.3      | -0.4      | -0.9 | +0.2 | —           | Do. +0.2.                                           |
| Lissan - - -          | -0.2      | -0.3      | -0.1 | +0.1 | —           |                                                     |
| Londonderry - -       | -0.4      | -0.3      | +0.8 | +0.6 | —           |                                                     |
| Markree Castle -      | -0.2      | -0.3      | 0.0  | +0.3 | —           |                                                     |
| Mount Nugent - -      | -0.2      | -0.2      | +0.7 | 0.0  | —           | Do. +0.5.                                           |
| Parsonstown - -       | -0.7      | +0.1      | -0.6 | +0.2 | —           | Do. +2.3.                                           |
| St. David's - -       | -0.4      | -0.5      | +0.2 | -0.2 | —           | Do. 0.0.                                            |

Mr. Buchan (Letter 1990) asked if the Council would allow of the erection of a seismometer at the low-level Ben Nevis Observatory, as proposed by Professor Ewing, F.R.S., and at his expense. The requisite permission was given provided that the meteorological instruments at the observatory were not seriously disturbed from their present positions.

Read—A letter from Mr. Baillie, stating that since last meeting 22 logs had been received, 18 of them being “excellent.”

Mr. Scott was instructed to present the charts O. 90 to Captain D. E. Jamieson, SS. “Port Adelaide,” and to Lieutenant G. E. B. Hand, H.M.S. “Egeria,” and to convey the best thanks of the Council to the other observers.

Read—Letter 1722, from Captain W. Usborne Moore, H.M.S. “Rambler,” requesting that the Office would present books to his quartermasters.

Mr. Scott was instructed to reply (P.C. 1880) that the Council regretted that they were not able to comply with his request.

Read—Letter 1820, from Mr. Dines, asking if the Council would lend “the self-recording helicoid anemometer, belonging to them,” for experiments to be carried on at the Blue Hill Observatory, Boston, United States.

Mr. Scott was instructed to reply (P.C. 1869) that the Council regretted that they could not grant the required permission.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

## 1. WARNINGS ISSUED.

## SUMMARY.

|                      |   |   |                 |
|----------------------|---|---|-----------------|
| A + B (successful) - | - | - | = 76 districts. |
| C (failures) -       | - | - | = 35 districts. |

## 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

One only, on night of October 7-8. Strong northerly gales in north-east of Scotland.

The depression which caused this gale was moving northwards so quickly on the 7th that it was believed it would pass away from our area before the increased pressure in the north-west could cause steep gradients. As a matter of fact, however, its progress was almost arrested, with the result that steep gradients were formed over Scotland, and the gales referred to set in very suddenly.

(Signed) FREDC. GASTER.

Reported—That daily forecasts had been sent to the Director of Naval Intelligence during the manœuvres, as in former years.

Reported—That Mr. Canham (Minutes, 1891, p. 83) was not yet fit to return to his duty (Letter 1686). A further extension of leave, for three months on half-pay, was granted (P.C. 1878), Mr. Canham to report again before the expiration of the leave.

Reported—That C. Goad, messenger, had been absent in hospital for about three months, but had returned to duty.

Submitted—The following reports on the 8.30 p.m. forecasts for July, August, and September 1892 :—

The letters used have the following signification :—

a = complete success.

b = partial (i.e. more than half) success.

c = partial failure.

d = total failure.

JULY.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 42            | 71       | 57                   | 86                                   |
| "                | b | 36            | 23       | 29                   |                                      |
| "                | c | 3             | 6        | 5                    |                                      |
| "                | d | 19            | 0        | 9                    |                                      |
| SCOTLAND, E.     | a | 48            | 68       | 58                   | 89                                   |
| "                | b | 36            | 26       | 31                   |                                      |
| "                | c | 6             | 6        | 6                    |                                      |
| "                | d | 10            | 0        | 5                    |                                      |
| ENGLAND, N.E.    | a | 55            | 65       | 60                   | 91                                   |
| "                | b | 32            | 29       | 31                   |                                      |
| "                | c | 10            | 3        |                      |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| ENGLAND, E.      | a | 52            | 61       | 57                   | 84                                   |
| "                | b | 29            | 26       | 27                   |                                      |
| "                | c | 19            | 7        | 13                   |                                      |
| "                | d | 0             | 6        | 3                    |                                      |
| MIDLAND COUNTIES | a | 55            | 52       | 54                   | 87                                   |
| "                | b | 32            | 35       | 33                   |                                      |
| "                | c | 10            | 10       | 10                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| ENGLAND, S.      | a | 49            | 55       | 52                   | 83                                   |
| "                | b | 32            | 29       | 31                   |                                      |
| "                | c | 19            | 10       | 14                   |                                      |
| "                | d | 0             | 6        | 3                    |                                      |
| SCOTLAND, W.     | a | 49            | 58       | 54                   | 80                                   |
| "                | b | 26            | 26       | 26                   |                                      |
| "                | c | 19            | 6        | 12                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| ENGLAND, N.W.    | a | 49            | 61       | 55                   | 89                                   |
| "                | b | 32            | 36       | 34                   |                                      |
| "                | c | 6             | 0        | 3                    |                                      |
| "                | d | 13            | 3        | 8                    |                                      |
| ENGLAND, S.W.    | a | 55            | 65       | 60                   | 89                                   |
| "                | b | 32            | 26       | 29                   |                                      |
| "                | c | 13            | 3        | 8                    |                                      |
| "                | d | 0             | 6        | 3                    |                                      |
| IRELAND, N.      | a | 45            | 65       | 55                   | 76                                   |
| "                | b | 29            | 13       | 21                   |                                      |
| "                | c | 16            | 13       | 15                   |                                      |
| "                | d | 10            | 9        | 9                    |                                      |
| IRELAND, S.      | a | 45            | 65       | 55                   | 80                                   |
| "                | b | 26            | 23       | 25                   |                                      |
| "                | c | 16            | 6        | 11                   |                                      |
| "                | d | 13            | 6        | 9                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 50            | 62       | 56                   | 85                                   |
| "                | b | 31            | 27       | 29                   |                                      |
| "                | c | 12            | 6        | 9                    |                                      |
| "                | d | 7             | 5        | 6                    |                                      |

## AUGUST.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 32            | 42       | 37                   | 88                                   |
| "                | b | 52            | 49       | 51                   |                                      |
| "                | c | 13            | 6        | 9                    |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| SCOTLAND, E.     | a | 42            | 58       | 50                   | 83                                   |
| "                | b | 45            | 20       | 33                   |                                      |
| "                | c | 10            | 19       | 14                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| ENGLAND, N.E.    | a | 45            | 45       | 45                   | 87                                   |
| "                | b | 42            | 42       | 42                   |                                      |
| "                | c | 10            | 13       | 12                   |                                      |
| "                | d | 3             | 0        | 1                    |                                      |
| ENGLAND, E.      | a | 55            | 39       | 47                   | 83                                   |
| "                | b | 29            | 42       | 36                   |                                      |
| "                | c | 10            | 19       | 14                   |                                      |
| "                | d | 6             | 0        | 3                    |                                      |
| MIDLAND COUNTIES | a | 45            | 32       | 39                   | 77                                   |
| "                | b | 32            | 45       | 38                   |                                      |
| "                | c | 10            | 20       | 15                   |                                      |
| "                | d | 13            | 3        | 8                    |                                      |
| ENGLAND, S.      | a | 45            | 39       | 42                   | 86                                   |
| "                | b | 39            | 48       | 44                   |                                      |
| "                | c | 10            | 10       | 10                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| SCOTLAND, W.     | a | 36            | 36       | 36                   | 75                                   |
| "                | b | 42            | 35       | 39                   |                                      |
| "                | c | 19            | 13       | 16                   |                                      |
| "                | d | 3             | 16       | 9                    |                                      |
| ENGLAND, N.W.    | a | 29            | 42       | 36                   | 79                                   |
| "                | b | 55            | 32       | 43                   |                                      |
| "                | c | 10            | 20       | 15                   |                                      |
| "                | d | 6             | 6        | 6                    |                                      |
| ENGLAND, S.W.    | a | 42            | 42       | 42                   | 78                                   |
| "                | b | 39            | 32       | 36                   |                                      |
| "                | c | 13            | 13       | 13                   |                                      |
| "                | d | 6             | 13       | 9                    |                                      |
| IRELAND, N.      | a | 42            | 65       | 54                   | 81                                   |
| "                | b | 35            | 19       | 27                   |                                      |
| "                | c | 10            | 6        | 8                    |                                      |
| "                | d | 13            | 10       | 11                   |                                      |
| IRELAND, S.      | a | 42            | 52       | 47                   | 76                                   |
| "                | b | 32            | 26       | 29                   |                                      |
| "                | c | 20            | 13       | 17                   |                                      |
| "                | d | 6             | 9        | 7                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 42            | 45       | 44                   | 81                                   |
| "                | b | 40            | 35       | 37                   |                                      |
| "                | c | 12            | 14       | 13                   |                                      |
| "                | d | 6             | 6        | 6                    |                                      |

## SEPTEMBER.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success<br>a + b. |
|------------------|---|---------------|----------|----------------------|-------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                     |
| SCOTLAND, N.     | a | 33            | 47       | 40                   | 79                                  |
| "                | b | 37            | 40       | 39                   |                                     |
| "                | c | 23            | 7        | 15                   |                                     |
| "                | d | 7             | 6        | 6                    |                                     |
| SCOTLAND, E.     | a | 40            | 50       | 45                   | 71                                  |
| "                | b | 24            | 27       | 26                   |                                     |
| "                | c | 23            | 13       | 18                   |                                     |
| "                | d | 13            | 10       | 11                   |                                     |
| ENGLAND, N.E.    | a | 33            | 40       | 37                   | 70                                  |
| "                | b | 33            | 33       | 33                   |                                     |
| "                | c | 27            | 24       | 25                   |                                     |
| "                | d | 7             | 3        | 5                    |                                     |
| ENGLAND, E.      | a | 37            | 50       | 44                   | 79                                  |
| "                | b | 40            | 30       | 35                   |                                     |
| "                | c | 23            | 17       | 20                   |                                     |
| "                | d | 0             | 3        | 1                    |                                     |
| MIDLAND COUNTIES | a | 30            | 63       | 47                   | 77                                  |
| "                | b | 43            | 17       | 30                   |                                     |
| "                | c | 27            | 10       | 18                   |                                     |
| "                | d | 0             | 10       | 5                    |                                     |
| ENGLAND, S.      | a | 37            | 57       | 47                   | 89                                  |
| "                | b | 53            | 30       | 42                   |                                     |
| "                | c | 10            | 13       | 11                   |                                     |
| "                | d | 0             | 0        | 0                    |                                     |
| SCOTLAND, W.     | a | 27            | 33       | 30                   | 62                                  |
| "                | b | 20            | 44       | 32                   |                                     |
| "                | c | 40            | 10       | 25                   |                                     |
| "                | d | 13            | 13       | 13                   |                                     |
| ENGLAND, N.W.    | a | 30            | 43       | 37                   | 70                                  |
| "                | b | 27            | 40       | 33                   |                                     |
| "                | c | 30            | 7        | 19                   |                                     |
| "                | d | 13            | 10       | 11                   |                                     |
| ENGLAND, S.W.    | a | 23            | 70       | 47                   | 74                                  |
| "                | b | 37            | 17       | 27                   |                                     |
| "                | c | 30            | 7        | 18                   |                                     |
| "                | d | 10            | 6        | 8                    |                                     |
| IRELAND, N.      | a | 33            | 53       | 43                   | 79                                  |
| "                | b | 33            | 37       | 35                   |                                     |
| "                | c | 17            | 10       | 14                   |                                     |
| "                | d | 17            | 10       | 13                   |                                     |
| IRELAND, S.      | a | 20            | 37       | 29                   | 67                                  |
| "                | b | 30            | 47       | 38                   |                                     |
| "                | c | 27            | 6        | 17                   |                                     |
| "                | d | 23            | 10       | 16                   |                                     |
| SUMMARY.         |   |               |          |                      |                                     |
| BRITISH ISLES    | a | 31            | 49       | 40                   | 74                                  |
| "                | b | 34            | 33       | 34                   |                                     |
| "                | c | 25            | 11       | 18                   |                                     |
| "                | d | 10            | 7        | 8                    |                                     |

Submitted—The following statement of accounts for the six months ending 30th September 1892 :—

| INCOME.                                           |        |    |              | EXPENDITURE.                                                 |       |    |              |
|---------------------------------------------------|--------|----|--------------|--------------------------------------------------------------|-------|----|--------------|
|                                                   | £      | s. | d.           |                                                              | £     | s. | d.           |
| Balance from year 1891-92                         | -      | -  | -            | ADMINISTRATION :                                             |       |    |              |
| Proportion of vote                                | -      | -  | -            | Payment of Council                                           | 500   | 0  | 0            |
| Repayment of expenses charged under—              |        |    |              | Secretary                                                    | 400   | 0  | 0            |
| (1.) Incidental expenses                          | 3      | 8  | 8            | Salaries and wages                                           | 399   | 3  | 0            |
| (2.) Observatories                                | 16     | 2  | 1            | Rent, fuel, and lighting                                     | 353   | 5  | 1            |
|                                                   |        |    |              | Furniture and fittings*                                      | 5     | 8  | 6            |
|                                                   |        |    | 19 10 9      | Incidental and contingent expenses                           | 169   | 6  | 8            |
| SUPPLY OF WEATHER INFORMATION :                   |        |    |              | Expenses incidental to International Meteorological Congress | 2     | 8  | 0            |
| D.W. Charts and Forecasts                         | 139    | 10 | 3            | Pensions                                                     | 93    | 8  | 2            |
| 6 p.m. Charts                                     | 12     | 10 | 0            |                                                              |       |    | 1,922 19 5   |
| Information for Press Agencies, &c.               | 50     | 3  | 2            | SPECIAL RESEARCHES                                           | -     | -  | -            |
| Telegrams                                         | 89     | 9  | 7            |                                                              |       |    | 456 2 1      |
|                                                   |        |    | 291 13 0     | LAND METEOROLOGY :                                           |       |    |              |
| SALE OF INSTRUMENTS, &c. :                        |        |    |              | Observatories and stations*                                  | 1,195 | 4  | 11           |
| "M.O." account                                    | 7      | 1  | 6            | Discussion and reduction of observations                     | 622   | 9  | 6            |
| Royal Navy account                                | 4      | 9  | 4            |                                                              |       |    | 1,817 14 5   |
| Mercantile Marine account                         | 14     | 14 | 0            | WEATHER INFORMATION AND FORECASTS :                          |       |    |              |
|                                                   |        |    | 26 4 10      | Telegraphic reports and storm warnings                       | 1,169 | 6  | 7            |
| Commission charged on work done for Colonies, &c. | -      | -  | -            | Preparation and issue of reports and forecasts               | 915   | 9  | 8            |
|                                                   |        |    | 5 18 1       |                                                              |       |    | 2,084 16 3   |
|                                                   |        |    |              | INSPECTIONS :                                                |       |    |              |
|                                                   |        |    |              | Salaries and travelling*                                     | -     | -  | -            |
|                                                   |        |    |              |                                                              |       |    | 216 1 10     |
|                                                   |        |    |              | OCEAN METEOROLOGY :                                          |       |    |              |
|                                                   |        |    |              | Discussion and reduction of observations                     | 837   | 3  | 6            |
|                                                   |        |    |              | Expenses incidental to the supply of instruments :           |       |    |              |
|                                                   |        |    |              | Proportion for care and issue of instruments                 | 100   | 0  | 0            |
|                                                   |        |    |              | Royal Navy                                                   | 110   | 15 | 6            |
|                                                   |        |    |              | Mercantile Marine                                            | 157   | 14 | 0            |
|                                                   |        |    |              | Distant island and coast stations                            | 17    | 10 | 8            |
|                                                   |        |    |              |                                                              |       |    | 1,223 3 8    |
|                                                   |        |    |              | Balance                                                      | -     | -  | -            |
|                                                   |        |    |              |                                                              |       |    | 1,294 19 3   |
|                                                   |        |    | £9,015 16 11 |                                                              |       |    | £9,015 16 11 |
| LIABILITIES.                                      |        |    |              | ASSETS.                                                      |       |    |              |
|                                                   | £      | s. | d.           |                                                              | £     | s. | d.           |
| To Council                                        | 500    | 0  | 0            | By cash at Bank                                              | 1,445 | 1  | 9            |
| „ contracts or work uncompleted                   | 237    | 10 | 0            | „ „ at Office                                                | 87    | 19 | 2            |
| „ Post Office (partly estimated)                  | 248    | 4  | 8            | „ H.M. Exchequer                                             | 650   | 0  | 0            |
| „ sundry creditors                                | 228    | 4  | 1            | „ sundry debtors                                             | 325   | 17 | 1            |
| „ balance                                         | 1,294  | 19 | 3            |                                                              |       |    |              |
|                                                   | £2,508 | 18 | 0            |                                                              |       |    | £2,508 18 0  |

\* Some expenses under this head not yet brought to account.

Submitted—The following reports of work during the three months ending September 30, 1892:—

## MARINE BRANCH.

October 19, 1892.

Examined 26 new logs and 7 lighthouse registers.

Advancing the discussion of the data for the district between the Cape of Good Hope and New Zealand; grouping the winds in homogenous areas; obtaining monthly mean results for barometer and air and sea temperatures; and drawing isobars and isotherms.

For the current charts 353 men-of-war logs were received from the Public Record Office, completing the period back to the year 1830. In all 5,917 Navy logs have been dealt with for the 33 years down to 1862. The information relating to the Pacific being still very meagre, the Minister of Marine at Paris has supplied from French logs about 9,000 current observations in that ocean; the Meteorological Institute of the Netherlands has contributed further extracts from Dutch and Swedish ships, and a member of the staff has spent some days in the City collecting information from the logs of steam and sailing ships at the offices of the China Mutual Steam Navigation Company, and of Messrs. Potter Brothers.

Time, as available, has been given to advancing the preparation of the Red Sea charts.

(Signed) CHAS. HARDING,

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

## TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

To 30th September 1892 (from 1st July).

*Monthly Weather Reports*, 1881.—In hand by Mr. Brodie.

*Weekly Weather Report*, 1892.—All numbers issued promptly.

*Appendix I*, Part 2.—Issued in good time. Part 3 well in hand.

*Supplements*, Monthly Summaries.—None issued since that for January.

*Daily Weather Reports*.—All issued to date, with monthly correction and addition sheets up to and including that for August. Title-page and frontispiece map ready for issue.

*Primary Checking Storm Warnings*, 1892.—Done to date.

*Checking 8.30 p.m. Daily Forecasts*.—Not quite up to date, but in hand.

*Re-tabulating Observations of Fog*, 1876–1881 by Mr. Brodie (assisting Mr. Scott).—Done.

*Re-plotting and arranging Rainfall Stations* (Symons') as directed by Council.—Well in hand, about half done.

*Totalling and averaging of Fog and Haze Observations*, 1876–90 (by Mr. Hood, under Mr. Gaster's instructions).—Completed, and forms for summary in course of preparation.

*Preparation of Mean Monthly Values for Rainfall, Temperatures, Bright Sunshine, Accumulated Heat, &c.*, and for lustra and for long periods.—In progress.

*Issuing of Hay and Corn Harvest Forecasts*, 1892.—Completed.

*Checking accuracy of same*.—Commenced.

The annual vacations have now been taken by nearly all the staff.

The long illness of Mr. Goad has been a drawback also, as the printing of the daily forecasts has been thrown on another member of the staff.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
October 19, 1892.

## PANTAGRAPH ROOM.

October 1, 1892.

*Hourly Means.*

Proof sheets of "*Hourly Means*" for 1889 read and revised, and the volume passed for press.

The calculation of the tables of means for 1890 is approaching completion, and an instalment of the sheets has been sent to the printer.

The routine work of the room has been kept up to date.

The summer vacation has been taken during the period embraced by this report.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

## EXAMINATION BRANCH.

1st October 1892.

*Examinations.*

*March–May* 1892.—Completed.

*June* 1892.—Partial.

Weekly examination (on receipt) of curves and documents from all observatories.

*Reports.*

*January–May* 1892.—Copies of "Notes of Errors" to all observatories.

## Miscellaneous.

*Diurnal Range of Rainfall, 1871-1890.*—Proceeded with the examination and correction of the Hourly Values, 1882-83.

*Valencia, barograph and thermograph scale values, and thermograph zero lines values.*—Measurements, &c., re the determination of these.

Revising Form No. 47 (rain-gauge), and correcting three proofs thereof. Also Forms 32 (weather), and 32a (cloud).

Preparing and copying inspectors' notes for the annual inspection, and interview with inspector.

Mr. Parsons has been much occupied with the printing of the forecasts, changing the balcony boards, &c., and various minor matters and work of a routine character have occupied some time. The annual vacation has also been taken during the period under notice.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts :—

|                                                                                      | £     | s. | d. |
|--------------------------------------------------------------------------------------|-------|----|----|
| Cash balance on 26th July - - -                                                      | 4,459 | 13 | 4  |
| Add draft on Brussels lodged at bank on 14th July<br>and credited on 29th July - - - | 12    | 18 | 8  |
| Receipts from 26th July to 18th October - -                                          | 3,715 | 6  | 3  |
|                                                                                      | 8,187 | 18 | 3  |
| Cheques drawn from 26th July to 18th October -                                       | 3,256 | 11 | 9  |
|                                                                                      | 4,931 | 6  | 6  |
| Balance on 18th October - - -                                                        | 4,931 | 6  | 6  |

Submitted—The following list of publications which had been received since the last meeting :—

*Hobart, Royal Society of Tasmania.*—Papers and Proceedings for 1891.

*Cracow, C. K. Akademii Umiejetności.*—Materyal y do Klimatografii Galicyi. 1891.

*York, Yorkshire Philosophical Society.*—Annual report. 1891.

*Hutchins, C. C.*—Radiation of atmospheric air.

*Abbe, C.*—Atmospheric radiation of heat and its importance in meteorology.

— Memoir of William Ferrel. 1817-1891.

*London, Royal National Lifeboat Institution.*—The Lifeboat Journal. Vol. xiv. 1889-91.

*Greenwich, Royal Observatory.*—Results of the magnetical and meteorological observations made . . . in the year 1889.

*Symons, G. J.*—British rainfall. 1891.

*Sydney Observatory.*—Results of meteorological observations made in New South Wales during 1889.

— — Results of rain, river, and evaporation observations made in New South Wales during 1890.

*Russell, H. C.*—A cyclonic storm or tornado in the Gwydir district.

— Notes on the rate of growth of some Australian trees.

*Watts, F.*—The hurricane over the West Indies, August 18th-19th, 1891.

*Davis, W. M.*—Meteorology in the schools.

— Memoir of Professor William Ferrel.

— The theories of artificial and natural rainfall.

*Allahabad, Meteorological Office.*—Brief sketch of the meteorology of the North-Western Provinces and Oudh and adjacent parts of Rajputana and the Panjab for the year 1891.

*Mascart, E.*—Sur l'arc-en-ciel.

*Paulsen, A.*—Perturbation magnétique des 13 et 14 février 1892.

— Communications de l'observatoire magnétique de Copenhague.

*Rajna, M.*—Sull' escursione diurna della declinazione magnetica a Milano in relazione col periodo delle macchie solari.

*Carlsruhe, Centralbureau für Meteorologie und Hydrographie.*—Die Ergebnisse der meteorologischen Beobachtungen im Jahre 1891.

— Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogthum Baden 1890. 1892, 1 Halbjahr.

*Brisbane, Chief Weather Bureau.*—Meteorological report for 1888, 1889, 1890, and 1891.

*Tonga.*—Statistics of the Tonga Islands for the year 1891.

*Calcutta, Meteorological Office.*—Memorandum on the snowfall in the mountain districts bordering Northern India and the abnormal features of the weather in India during the past five months, with a forecast of the probable character of the south-west monsoon rains of 1892.

*Croydon Microscopical and Natural History Club.*—Report of the Meteorological Sub-Committee for 1891.

*Trinidad, Royal Botanic Gardens.*—Annual report. 1891.

*Prague, K. K. Sternwarte.*—Magnetische und meteorologische Beobachtungen. 1891.

*Lahore, Sanitary Commissioner.*—Report on the Sanitary Administration of the Punjab for the year 1891.

- Sheward, R.*—Abstracts of weather reports for five years, July 1887 to 1892, at Eastbourne.
- André, C.*—Contribution à l'étude de l'électricité atmosphérique.
- Krásno, Agrarmeteorologisches Observatorium.*—Grafische Darstellung der Niederschläge im Neutrathale an der Station Alt-Krásno (vordem Nedanócz) während der Jahre 1866–1891.
- Schlee, P.*—Niederschlag, Gewitter und Bewölkung im südwestlichen und in einem Theile des tropischen Atlantischen Ozeans nach den meteorologischen Schiffsjournalen der Deutschen Seewarte.
- Washington, Weather Bureau.*—A report on the relations of soil to climate.
- Notes on a new method for the discussion of magnetic observations.
- London, Admiralty.*—Tide tables for the British and Irish Ports, for the year 1893.
- Clements, H.*—Clements' weather chart almanac for 1893.
- Weather prediction; or, how the weather, for any given place, may be forecasted, by means of the moon's motions and the weather records of the past.
- Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.*—Nederlandsch meteorologisch Jaarboek. 1880 Decl. ii., 1891.
- Karlinski, F.*—Stan Wody na rzekach Galicyjskich oraz opad atmosferyczny. 1889, 1890.
- Helsingfors, Institut Météorologique Central.*—Observations météorologiques faites à Helsingfors en 1891.
- Bombay, Government Observatory.*—Magnetical and meteorological observations. 1890.
- Washington, Weather Bureau.*—Some physical properties of soils in their relation to moisture and crop distribution.
- Emden, Naturforschende Gesellschaft.*—Jahresbericht pro 1890–91.
- Greenwood, W.*—Greenwood's nautical, general, and coasting kludonometric tide tables. 1893.
- Hong-Kong Observatory.*—Observations made at the Hong-Kong Observatory in the year 1891.
- Montsouris, Observatoire Municipal.*—Annuaire pour les années 1892–1893.
- Helsingfors, Finska Vetenskaps-Societeten.*—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. xxxiii., 1890–91.
- Aitken, John.*—On some phenomena connected with cloudy condensation.
- Tebbutt, J.*—Report of Mr. Tebbutt's Observatory, the Peninsula, Windsor, New South Wales. for the year 1891.
- London, Meteorological Office.*—Hourly means of the readings obtained from the self-recording instruments at the four observatories under the Meteorological Council. 1889.
- Washington, Smithsonian Institution.*—Smithsonian contributions to knowledge. Vol. xxviii.
- Berlin, Königlich Preussisches Meteorologisches Institut.*—Ergebnisse der meteorologischen Beobachtungen im Jahre 1889.
- Dehra Dun, Surveyor-General of India.*—General report on the operations of the Survey of India Department during 1890–91.
- Peek, C. E.*—Meteorological observations at Rousdon Observatory for the year 1891.
- London, Imperial Institute.*—The year-book of the Imperial Institute of the United Kingdom, the Colonies and India. 1892.
- Vienna, K.K. Central-Anstalt für Meteorologie und Erdmagnetismus.*—Jahrbücher. 1890.
- Klossovsky, A.*—L'état actuel du réseau spécial des stations météorologiques du sud-ouest de la Russie l'année 1891, &c.
- L'anémographe de M. Timtchenko.
- Odessa, Observatoire Météorologique de l'Université.*—Revue météorologique. Travaux du réseau météorologique du sud-ouest de la Russie l'année 1891.
- Cape Town, Meteorological Commission.* Report. 1891.
- Hamburg, Deutsche Seewarte.*—Aus dem Archiv der Deutschen Seewarte. xiv. Jahrg. 1891.
- Lisbon, Observatorio do Infante D. Luiz.*—Annaes. Vol. xxvi. 1888.
- Annaes. Observações do postos meteorologicos. 1886.
- Wellington, Meteorological Office.*—Annual rainfall for each year from 1864 to 1891.
- Meteorological observations. 1891.
- Hamberg, H. E.*—Sur une prétendue période de presque 26 jours dans les orages.
- Washington, U.S. Naval Observatory.*—Magnetic disturbances. 1892.
- Elster, J., und Geitel, H.*—Beobachtungen des atmosphärischen Potentialgefälles und der ultravioletten Sonnenstrahlung.
- Calcutta, Meteorological Office.*—Summary of the meteorology of the year 1891.
- Rome, Ufficio Centrale Meteorologico e Geodinamico Italiano.*—Annali. 1888, Parts i.–iv.; 1889, Part iii.
- London, Board of Trade.*—Abstracts of the Returns made to the Board of Trade of Shipping Casualties which occurred on or near the Coasts or in Rivers and Harbours of the United Kingdom from the 1st July 1890 to the 30th June 1891.
- Straits Settlements.*—Report on the Medical Department of the State of Sungei Ujong. 1891.
- Annual report on the State of Perak, for the year 1891.
- Annual report on the State of Negri Sembilan, for the year 1891.
- Annual report on the State of Pahang, for the year 1891.
- Annual meteorological report, Straits Settlements, for the year 1891.

THE Second Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, S.W., on Wednesday, November 2nd, 1892, at the hour of 2.30 p.m.

The following Members were present :—

Lieut.-Gen. R. STRACHEY, R.E., Chairman, in the Chair.

Mr. ALEXANDER BUCHAN.

Professor GEORGE DARWIN.

Mr. FRANCIS GALTON.

Mr. EDWARD J. STONE.

Captain WILLIAM J. L. WHARTON, R.N.

Mr. ROBERT H. SCOTT (Secretary).

The Secretary read the notice convening the meeting as follows :—

Meteorological Office, 63, Victoria Street,  
London, October 24, 1892.

SIR,

I BEG to inform you that the second ordinary general meeting of the Meteorological Council will be held on Wednesday, the 2nd proximo, at 2h. 30m. p.m., for the consideration of the expenditure of the year 1891-92, for the preparation of the Estimates for the year 1893-94, and for the transaction of other ordinary business.

I am, &c.  
(Signed) R. H. SCOTT,  
Secretary.

The Secretary reported that in accordance with the Articles :—

1. The Council had submitted a Report of its proceedings to the Royal Society for presentation to Parliament.

2. That the annual estimates for the year 1892-93 had been prepared, and submitted to the Treasury and approved; and that the accounts up to 31st March 1892 had been examined by two members of the Council, and had been submitted for audit in the usual course.

3. That ordinary meetings of the Council had been held on the following days :—

|      |   |          |    |      |   |       |    |      |   |         |    |
|------|---|----------|----|------|---|-------|----|------|---|---------|----|
| 1891 | - | December | 2  | 1892 | - | March | 9  | 1892 | - | June    | 15 |
| "    | - | "        | 16 | "    | - | "     | 23 | "    | - | "       | 29 |
| "    | - | "        | 30 | "    | - | April | 6  | "    | - | July    | 13 |
| 1892 | - | January  | 13 | "    | - | "     | 20 | "    | - | "       | 27 |
| "    | - | "        | 27 | "    | - | May   | 4  | "    | - | October | 19 |
| "    | - | February | 10 | "    | - | "     | 18 |      |   |         |    |
| "    | - | "        | 24 | "    | - | June  | 1  |      |   |         |    |

4. That the proceedings had been regularly recorded and printed.

The meeting then adjourned.

The Minutes of the last ordinary meeting (October 19) were read and confirmed.

Read—Letter 1890 from Mr. R. FitzGerald (Minutes, p. 32), suggesting that the arbitrator ought to be a builder, instead of the County Surveyor.

Mr. Scott reported that he had already written to Mr. Cullum (P.C. 1918) asking for the name of a respectable local builder, and had heard (Letter 1920) that Mr. Carroll, assistant to the contractor's manager for the railway, would be a suitable person.

Mr. Scott was authorised to submit Mr. Carroll's name to Mr. FitzGerald (P.C. 1990).

Read—Letter 1869 from Dr. Neumayer, asking if the Office could supply him with information from the Pacific Ocean, north of lat. 30° N.

Mr. Scott was instructed to reply (P.C. 1964), asking if Dr. Neumayer was aware of the large amount of material in the Office, over 25,000 days observations.

Submitted—The following memoranda :—

## MATERIALS for preparing ESTIMATES for 1893-94.

|                                                                                         | Actual<br>Expenditure<br>1891-92. | Estimated<br>Expenditure<br>1893-94. | Proposed<br>for<br>1893-94. | Voted<br>for<br>1892-93. |
|-----------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------|-----------------------------|--------------------------|
| <i>Administration :</i>                                                                 | £                                 | £                                    | £                           | £                        |
| (1.) Council - - - - -                                                                  | 993                               | 1,000                                | 1,000                       | 1,000                    |
| (2.) Secretary - - - - -                                                                | 800                               | 800                                  | 800                         | 800                      |
| (3.) Salaries : - - - - -                                                               | -                                 | 802                                  | 800                         | 790                      |
| Chief Clerk - - - - -                                                                   | 333                               |                                      |                             |                          |
| 1 Junior Clerk - - - - -                                                                | 200                               |                                      |                             |                          |
| 2 unclassified clerks - - - - -                                                         | 86                                |                                      |                             |                          |
| Office Keeper - - - - -                                                                 | 109                               |                                      |                             |                          |
| Messenger - - - - -                                                                     | 65                                |                                      |                             |                          |
|                                                                                         | 793                               |                                      |                             |                          |
| Add for present salaries and probable increment -                                       | 9                                 |                                      |                             |                          |
|                                                                                         | 802                               |                                      |                             |                          |
| (4.) Rent, fuel, and lighting - - - - -                                                 | -                                 | 703                                  | 710                         | 710                      |
| Rent - - - - -                                                                          | 635                               |                                      |                             |                          |
| Fuel - - - - -                                                                          | 42                                |                                      |                             |                          |
| Gas - - - - -                                                                           | 26                                |                                      |                             |                          |
|                                                                                         | 703                               |                                      |                             |                          |
| (5.) Incidental and contingent expenses - - - - -                                       | -                                 | 542                                  | 450                         | 460                      |
| Office Keeper's contingent account, including<br>porter's allowance for cleaning, &c. - | 199                               |                                      |                             |                          |
| Postage - - - - -                                                                       | 61                                |                                      |                             |                          |
| Furniture and Office repairs - - - - -                                                  | 202                               |                                      |                             |                          |
| Carriage of parcels, &c. - - - - -                                                      | 21                                |                                      |                             |                          |
| Books and printing - - - - -                                                            | 32                                |                                      |                             |                          |
| International Meteorology - - - - -                                                     | 33                                |                                      |                             |                          |
| Sundries - - - - -                                                                      | 76                                |                                      |                             |                          |
|                                                                                         | 624                               |                                      |                             |                          |
| Deduct (1) repayments under this head<br>including Commission - - - - - £49             |                                   |                                      |                             |                          |
| „ (2) expenses under International<br>Meteorology - - - - - £33                         | 82                                |                                      |                             |                          |
|                                                                                         | 542                               |                                      |                             |                          |
| (6.) Pensions - - - - -                                                                 | -                                 | 187                                  | 190                         | 190                      |
| Capt. H. Toynbee - - - - -                                                              | 144                               |                                      |                             |                          |
| Mr. J. S. Harding, senr. - - - - -                                                      | 43                                |                                      |                             |                          |
|                                                                                         | 187                               |                                      |                             |                          |
| <i>Special Researches and Experiments</i> - - - - -                                     | -                                 | 1,000                                | 1,000                       | 1,000                    |
| (1.) Researches :                                                                       |                                   |                                      |                             |                          |
| Bridled anemometer (Holyhead) - - - - -                                                 | 22                                |                                      |                             |                          |
| Cloud experiments - - - - -                                                             | 57                                |                                      |                             |                          |
| Actinometer observations - - - - -                                                      | 7                                 |                                      |                             |                          |
| Electrical anemometer - - - - -                                                         | 2                                 |                                      |                             |                          |
| Royal Naval Exhibition - - - - -                                                        | 33                                |                                      |                             |                          |
| Dines's anemometer experiments - - - - -                                                | 33                                |                                      |                             |                          |
| Calculation of hourly means - - - - -                                                   | 72                                |                                      |                             |                          |
| Sundries - - - - -                                                                      | 12                                |                                      |                             |                          |
|                                                                                         | 238                               |                                      |                             |                          |
| (2.) Salaries :                                                                         |                                   |                                      |                             |                          |
| 1 Junior Clerk - - - - - £150                                                           |                                   |                                      |                             |                          |
| Female staff - - - - - £266                                                             |                                   |                                      |                             |                          |
|                                                                                         | £416                              |                                      |                             |                          |
| Add for present salaries and increments authorised 25                                   |                                   |                                      |                             |                          |
| Transfer from head <i>Land Meteorology</i> ‡ 250                                        | 691                               |                                      |                             |                          |
|                                                                                         | 929                               |                                      |                             |                          |
| Carried forward - - - - -                                                               | -                                 | 5,034                                | 4,950                       | 4,950                    |

|                                                                                                                                                      | Actual<br>Expenditure<br>1891-92. | Estimated<br>Expenditure<br>1893-94. | Proposed<br>for<br>1893-94. | Voted<br>for<br>1892-93. |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------|-----------------------------|--------------------------|
| Brought forward - - -                                                                                                                                | - -                               | £ 5,034                              | £ 4,950                     | £ 4,950                  |
| <b>Land Meteorology :</b>                                                                                                                            |                                   |                                      |                             |                          |
| (1.) Observatories and stations - - -                                                                                                                | - -                               | 2,295                                | 2,240                       | 2,200                    |
| Aberdeen (allowance 275 <i>l.</i> ) - - -                                                                                                            | 277                               |                                      |                             |                          |
| Armagh ( " 50 <i>l.</i> ) - - -                                                                                                                      | 51                                |                                      |                             |                          |
| Ben Nevis ( " 100 <i>l.</i> ) - - -                                                                                                                  | 100                               |                                      |                             |                          |
| Falmouth ( " 250 <i>l.</i> ) - - -                                                                                                                   | 253                               |                                      |                             |                          |
| Fort William ( " 250 <i>l.</i> ) - - -                                                                                                               | 256                               |                                      |                             |                          |
| Glasgow ( " 75 <i>l.</i> ) - - -                                                                                                                     | 80                                |                                      |                             |                          |
| Kew ( " 400 <i>l.</i> ) - - -                                                                                                                        | 410                               |                                      |                             |                          |
| Stonyhurst ( " 56 <i>l.</i> ) - - -                                                                                                                  | 59                                |                                      |                             |                          |
| Valencia (including purchase of Westwood House) - - -                                                                                                | 1,810                             |                                      |                             |                          |
| Anemograph stations - - -                                                                                                                            | 75                                |                                      |                             |                          |
| Meteorological Societies (Observations 2nd Order) - - -                                                                                              | 207                               |                                      |                             |                          |
| Instruments and sunshine cards - - -                                                                                                                 | 53                                |                                      |                             |                          |
| Sundries - - -                                                                                                                                       | 14                                |                                      |                             |                          |
|                                                                                                                                                      | £ 3,645                           |                                      |                             |                          |
| Deduct cost of lease of Westwood House - 1,300                                                                                                       | -                                 |                                      |                             |                          |
| Also difference between old and new rent, and allowance for grazing receipts (say) - 50                                                              | -                                 |                                      |                             |                          |
|                                                                                                                                                      | 1,350                             |                                      |                             |                          |
|                                                                                                                                                      | 2,295                             |                                      |                             |                          |
| (2.) Salaries :—Discussion and reduction of observations - - -                                                                                       | - -                               | 1,271                                | 1,260                       | 1,300                    |
| 2 Senior Clerks - - -                                                                                                                                | 515                               |                                      |                             |                          |
| 7 Junior Clerks - - -                                                                                                                                | 845                               |                                      |                             |                          |
| 4 Unclassified Clerks - - -                                                                                                                          | 161                               |                                      |                             |                          |
|                                                                                                                                                      | 1,521                             |                                      |                             |                          |
| Transfer to head of <i>Special Researches</i> - - -                                                                                                  | 250                               |                                      |                             |                          |
|                                                                                                                                                      | 1,271                             |                                      |                             |                          |
| The additions for present salaries and increments authorised would be 53 <i>l.</i> , but these are counterbalanced by the reduced pay to Mr. Canham. |                                   |                                      |                             |                          |
| <b>Weather Information and Forecasts - - -</b>                                                                                                       | - -                               | 2,099                                | 2,000                       | 1,940                    |
| (1.) Telegraphic reports and storm warnings :—                                                                                                       |                                   |                                      |                             |                          |
| Reports from inland stations - - -                                                                                                                   | 583                               |                                      |                             |                          |
| Reports from abroad - - -                                                                                                                            | 121                               |                                      |                             |                          |
| Reports sent abroad - - -                                                                                                                            | 376                               |                                      |                             |                          |
| Storm warnings - - -                                                                                                                                 | 244                               |                                      |                             |                          |
| Hay harvest forecasts - - -                                                                                                                          | 37                                |                                      |                             |                          |
| Private wires - - -                                                                                                                                  | 75                                |                                      |                             |                          |
| Payments to reporters, &c. - - -                                                                                                                     | 697                               |                                      |                             |                          |
| Sundry telegrams, forecasts, &c. - - -                                                                                                               | 27                                |                                      |                             |                          |
| Postage of charts and incidental expenses - - -                                                                                                      | 229                               |                                      |                             |                          |
| Instruments, &c. - - -                                                                                                                               | 78                                |                                      |                             |                          |
| Wrappers, printing, &c. - - -                                                                                                                        | 34                                |                                      |                             |                          |
| Weekly Reports - - -                                                                                                                                 | 51                                |                                      |                             |                          |
| Synchronous charts - - -                                                                                                                             | 26                                |                                      |                             |                          |
| Sundries - - -                                                                                                                                       | 23                                |                                      |                             |                          |
|                                                                                                                                                      | 2,601                             |                                      |                             |                          |
| Deduct :—                                                                                                                                            |                                   |                                      |                             |                          |
| Repayments during the same period, including 46 <i>l.</i> for instruments - - -                                                                      | 502                               |                                      |                             |                          |
|                                                                                                                                                      | 2,099                             |                                      |                             |                          |
| Carried forward - - -                                                                                                                                | - -                               | 10,699                               | 10,450                      | 10,390                   |

|                                                                                                                                                    | Actual<br>Expenditure<br>1891-92. | Estimated<br>Expenditure<br>1893-94. | Proposed<br>for<br>1893-94. | Voted<br>for<br>1892-93. |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------|-----------------------------|--------------------------|
|                                                                                                                                                    | £                                 | £                                    | £                           | £                        |
| Brought forward - - - - -                                                                                                                          | -                                 | 10,699                               | 10,450                      | 10,390                   |
| (2.) Salaries :—Preparation and issue of reports and forecasts - - - - -                                                                           | -                                 | 1,845                                | 1,840                       | 1,800                    |
| 1 Senior Clerk (9 hours daily) - - - - -                                                                                                           | 309                               |                                      |                             |                          |
| 7 Junior Clerks (5 work 9 hours daily) - - - - -                                                                                                   | 1,137                             |                                      |                             |                          |
| 2 Unclassified Clerks - - - - -                                                                                                                    | 104                               |                                      |                             |                          |
| 1 Messenger - - - - -                                                                                                                              | 65                                |                                      |                             |                          |
| Addition for late evening and Sunday attendance - - - - -                                                                                          | 210                               |                                      |                             |                          |
|                                                                                                                                                    | 1,825                             |                                      |                             |                          |
| Add for present salaries and increments authorised - - - - -                                                                                       | 20                                |                                      |                             |                          |
|                                                                                                                                                    | 1,845                             |                                      |                             |                          |
| <i>Inspections</i> - - - - -                                                                                                                       | -                                 | 584                                  | 550                         | 550                      |
| Mr. Baker - - - - -                                                                                                                                | 34                                |                                      |                             |                          |
| „ Buchan, salary and expenses - - - - -                                                                                                            | 208                               |                                      |                             |                          |
| „ Gaster - - - - -                                                                                                                                 | 6                                 |                                      |                             |                          |
| „ Ley, salary and expenses - - - - -                                                                                                               | 213                               |                                      |                             |                          |
| Royal Meteorological Society - - - - -                                                                                                             | 25                                |                                      |                             |                          |
| Mr. Scott - - - - -                                                                                                                                | 63                                |                                      |                             |                          |
| Mr. Whipple - - - - -                                                                                                                              | 35                                |                                      |                             |                          |
|                                                                                                                                                    | 584                               |                                      |                             |                          |
| <i>Ocean Meteorology :</i>                                                                                                                         |                                   |                                      |                             |                          |
| (1.) Salaries :—Discussion and reduction of observations :—                                                                                        | -                                 | 1,678                                | 1,650                       | 1,650                    |
| Marine Superintendent - - - - -                                                                                                                    | 400                               |                                      |                             |                          |
| 1 Senior Clerk (in charge of instruments) - - - - -                                                                                                | 333                               |                                      |                             |                          |
| 1 „ „ ( „ Marine Rooms) - - - - -                                                                                                                  | 275                               |                                      |                             |                          |
| 5 Junior Clerks - - - - -                                                                                                                          | 770                               |                                      |                             |                          |
| 2 Unclassified Clerks - - - - -                                                                                                                    | 92                                |                                      |                             |                          |
|                                                                                                                                                    | 1,870                             |                                      |                             |                          |
| Add for present salaries and increments authorised - - - - -                                                                                       | 8                                 |                                      |                             |                          |
|                                                                                                                                                    | 1,878                             |                                      |                             |                          |
| Deduct proportion chargeable to care and issue of instruments (say) - - - - -                                                                      | 200                               |                                      |                             |                          |
|                                                                                                                                                    | 1,678                             |                                      |                             |                          |
| (2.) Salaries :—Proportion chargeable to care and issue of instruments - - - - -                                                                   | -                                 | 200                                  | 200                         | 200                      |
| (3.) Supply of instruments to the Royal Navy - - - - -                                                                                             | -                                 | (a) 410                              | 400                         | 500                      |
| Instruments, repairs, &c. - - - - -                                                                                                                | 204                               |                                      |                             |                          |
| Verifications - - - - -                                                                                                                            | 37                                |                                      |                             |                          |
| Packing cases - - - - -                                                                                                                            | 13                                |                                      |                             |                          |
|                                                                                                                                                    | 254                               |                                      |                             |                          |
| Deduct repayments under this head - - - - -                                                                                                        | 26                                |                                      |                             |                          |
|                                                                                                                                                    | 228                               |                                      |                             |                          |
| (4.) Supply of instruments, &c. to Mercantile Marine - - - - -                                                                                     | -                                 | (a) 207                              | 190                         | 190                      |
| Instruments, repairs, &c. - - - - -                                                                                                                | 106                               |                                      |                             |                          |
| Verifications - - - - -                                                                                                                            | 8                                 |                                      |                             |                          |
| Agents' fees, &c. - - - - -                                                                                                                        | 99                                |                                      |                             |                          |
| Presentation labels - - - - -                                                                                                                      | 5                                 |                                      |                             |                          |
| Sundries - - - - -                                                                                                                                 | 6                                 |                                      |                             |                          |
|                                                                                                                                                    | 224                               |                                      |                             |                          |
| Deduct repayments under this head - - - - -                                                                                                        | 40                                |                                      |                             |                          |
|                                                                                                                                                    | 184                               |                                      |                             |                          |
| (a) The estimated expenditure under sub-heads (3) and (4) is taken as the approximate mean actual expenditure of two years ending 31st March 1892. |                                   |                                      |                             |                          |
| (5.) Distant island or coast stations - - - - -                                                                                                    | 27                                | 20                                   | 20                          | 20                       |
| The payments under this head are irregular.                                                                                                        |                                   |                                      |                             |                          |
| Totals - - - - - £                                                                                                                                 | -                                 | 15,643                               | 15,300                      | 15,300                   |

## SYNOPSIS of OFFICE SALARIES AND PENSIONS (estimated Expenditure).

| Service.                      | 1893-94. | 1892-93. | 1893-94.  |           |
|-------------------------------|----------|----------|-----------|-----------|
|                               |          |          | Increase. | Decrease. |
|                               | £        | £        | £         | £         |
| Administration - - - - -      | 1,602    | 1,590    | 12        | —         |
| Special Researches - - - - -  | 691      | 677      | 14        | —         |
| Land Meteorology - - - - -    | 1,271    | 1,302    | —         | 31        |
| Weather Information - - - - - | 1,845    | 1,834    | 11        | —         |
| Ocean Meteorology - - - - -   | 1,878    | 1,874    | 4         | —         |
| Pensions - - - - -            | 187      | 187      | —         | —         |
| Totals - - - - -              | £ 7,474  | 7,464    | 41        | 31        |

## METEOROLOGICAL OFFICE. ESTIMATES for the Year 1893-94.

| Heads of Service.                                                   | Proposed for 1893-94. |        | Voted for 1892-93. |        | 1893-94.  |           |
|---------------------------------------------------------------------|-----------------------|--------|--------------------|--------|-----------|-----------|
|                                                                     |                       |        |                    |        | Increase. | Decrease. |
|                                                                     | £                     | £      | £                  | £      | £         | £         |
| <b>Administration :</b>                                             |                       |        |                    |        |           |           |
| Payment of Council - - - - -                                        | 1,000                 | -      | 1,000              |        |           |           |
| Secretary - - - - -                                                 | 800                   | -      | 800                |        |           |           |
| Salaries and wages - - - - -                                        | 800                   | -      | 790                |        |           |           |
| Rent, fuel, and lighting - - - - -                                  | 710                   | -      | 710                |        |           |           |
| Incidental and contingent expenses - - - - -                        | 450                   | -      | 460                |        |           |           |
| Pensions - - - - -                                                  | 190                   | -      | 190                |        |           |           |
|                                                                     |                       | 3,950  |                    | 3,950  | —         | —         |
| <b>Special Researches and Experiments :</b>                         |                       |        |                    |        |           |           |
| Salaries - - - - -                                                  | 690                   | -      | 670                |        |           |           |
| Other charges - - - - -                                             | 310                   | -      | 330                |        |           |           |
|                                                                     |                       | 1,000  | -                  | 1,000  | —         | —         |
| <b>Land Meteorology :</b>                                           |                       |        |                    |        |           |           |
| Observatories and stations - - - - -                                | 2,240                 | -      | 2,200              |        |           |           |
| Salaries :—Discussion and reduction of observations - - - - -       | 1,260                 | -      | 1,300              |        |           |           |
|                                                                     |                       | 3,500  |                    | 3,500  | —         | —         |
| <b>Weather Information and Forecasts :</b>                          |                       |        |                    |        |           |           |
| Telegraphic reports and storm warnings - - - - -                    | 2,000                 | -      | 1,940              |        |           |           |
| Salaries :—Preparation and issue of reports and forecasts - - - - - | 1,840                 | -      | 1,800              |        |           |           |
|                                                                     |                       | 3,840  |                    | 3,740  | 100       | —         |
| <b>Inspections :</b>                                                |                       |        |                    |        |           |           |
| Salaries and travelling expenses - - - - -                          | -                     | 550    | -                  | 550    | —         | —         |
| <b>Ocean Meteorology :</b>                                          |                       |        |                    |        |           |           |
| Salaries :—Discussion and reduction of observations - - - - -       | 1,650                 | -      | 1,650              |        |           |           |
| Expenses incidental to the supply of instruments :                  |                       |        |                    |        |           |           |
| Care and issue of instruments - - - - -                             | 200                   | -      | 200                |        |           |           |
| Royal Navy - - - - -                                                | 400                   | -      | 500                |        |           |           |
| Mercantile Marine - - - - -                                         | 190                   | -      | 190                |        |           |           |
| Distant island (and coast) stations - - - - -                       | 20                    | -      | 20                 |        |           |           |
|                                                                     |                       | 2,460  |                    | 2,560  | —         | 100       |
| Totals - - - - -                                                    | £ -                   | 15,300 | -                  | 15,300 | 100       | 100       |

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 1973).

Read—Letter 1882 from Mr. Exham, Lloyd's agent at Rarotonga, Cook's Islands, asking if the Office would supply him with instruments.

The Hydrographer having spoken in favour of the project, it was resolved that the request be granted, cost not to exceed 10l.

Read—Letter 1477, from Mr. N. E. Harding, asking for the loan of instrument for use at Redonda, an island near Montserrat.

Mr. Scott stated that observations were already being published from Antigua and Guadeloupe, which are near Montserrat, and the Council decided not to grant the request (P.C. 1966).

Read—Letter 1858 from Professor Wild, inquiring if from January 1, 1893, the barometrical observations published in the Daily Weather Report would be reduced to the gravity of lat. 45°. (Minutes, 1884, p. 64; 1885, p. 41.)

Mr. Scott was instructed to reply that this correction would not be applied to the readings from British stations, at least at present (P.C. 1971), but that the correction was to be entered in a table in the printed barometrical readings.

Read—A memorandum from Mr. R. Curtis (Letter 1928), asking if he was to include records from Fort William in the volume of Hourly Readings for 1891. Mr. Scott was instructed to inquire what the Directors of the Ben Nevis Observatory proposed to do about publication of these results (P.C. 1972).

Read—A letter from Mr. Baillie, stating that since last meeting four logs had been received, two of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Read—Letter 1879 from Mr. H. R. Ainsley, stating that he was willing to act as agent for the Office at Cardiff. Mr. Scott was authorised to communicate with Mr. Ainsley, and, if the result was satisfactory, to appoint him.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

#### 1. WARNINGS ISSUED.

##### SUMMARY.

|                    |   |   |   |   |               |
|--------------------|---|---|---|---|---------------|
| A + B (successful) | - | - | - | = | 17 districts. |
| C (failures)       | - | - | - | = | 3 „           |

#### 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
November 2, 1892.

Submitted—The following reports of work during October 1892 :—

#### MARINE BRANCH.

November 1, 1892.

Examined 9 new logs.

Discussing the data for the district between the Cape of Good Hope and New Zealand. Grouping the winds in homogeneous areas, and drawing isobars and air and sea isotherms.

Advancing the preparation of the Red Sea charts, and the notes on the various elements represented.

For the Pacific current charts about 550 observations have been received from the Austrian Admiralty through Commander Leopold von Jedina, Naval Attaché to the Austro-Hungarian Embassy in London; also a number of logs of mail steamers running between San Francisco and Hong Kong have been received from the White Star Company (Messrs. Ismay, Imrie, and Co.), Liverpool.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

#### TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH. (To October 31, 1892.)

*Monthly Weather Report*, 1881.—Some progress made since last report.

*Weekly Weather Report*, 1892.—All numbers issued to date.

*Appendix I.*, Part 3, issued in very good time.

*Supplement* (Monthly Summaries) very little progress made at present.

*Daily Weather Report*, 1892.—All numbers issued to date, and corrections and additions to end of September.

*Primary Checking of Storm Signals*, 1892.—Done to date.

*Checking of 8.30 p.m. Forecasts*.—Done to date.

*Summarising Observations of Fog* on coasts of British Islands, 1876-90.—Done.

*Checking of Hay Harvest Forecasts*, 1892.—In progress.

*Plotting Rainfall Stations on Country Maps*, examining same, &c. In progress.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
November 2, 1892.

#### PANTAGRAPH ROOM.

November 1, 1892

The whole of the "copy" of *Hourly Means* for 1890 has been forwarded to the printer and the revise of the proof sheets has been commenced,

The calculation of the various mean values for 1891 has been begun.

Rather more time than usual has been spent during this past month in examining the cards received from the sunshine stations.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

#### EXAMINATION BRANCH.

November 1, 1892.

##### *Examinations.*

*January—March* 1891.—Times and values of the daily *maxima* and *minima* atmospheric pressures for Aberdeen, Falmouth, and Valencia.

*June* 1892.—Completed.

*July—September.*—Valencia work completed.

Weekly examination (on receipt) of curves and documents from all observatories.

##### *Reports.*

*June* 1892.—Copies of "Notes of Errors" to all observatories.

*Re* Valencia Barograph and Thermograph Scale and Thermograph Zero-line values.

##### *Miscellaneous.*

*Diurnal Range of Rainfall*, 1871-1890.—Examination and correction of the hourly values, 1884, proceeded with.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts:—

|                                                 | £     | s. | d. |
|-------------------------------------------------|-------|----|----|
| Cash balance on 18th October                    | 4,931 | 6  | 6  |
| Receipts from 19th October to 1st November      | 61    | 10 | 9  |
|                                                 | 4,992 | 17 | 3  |
| Cheques drawn from 19th October to 1st November | 1,077 | 16 | 0  |
|                                                 | 3,915 | 1  | 3  |
| Balance on 1st November                         |       |    |    |

Submitted—The following list of publications which had been received since the last meeting:—

*Paris, Comité International des Poids et Mesures.*—Procès-Verbaux des Séances de 1891.

*Lyons, Observatoire.*—Météorologie Lyonnaise, par C. André. 1887-88—1889-90.

*André, C.*—Relations des phénomènes météorologiques déduites de leurs variations diurnes et annuelles.

*Kammermann, A.*—Résumé météorologique de l'année 1891 pour Genève et le Grand Saint-Bernard.

*Edinburgh, Royal Society.*—Proceedings. Vol. xviii. 1890-91.

*Tromelin, Le G. de.*—Lois mécaniques de la circulation de l'atmosphère.

*Straits Settlements.*—Annual report of the State of Selangor for the year 1891.

*Mathiesen, H.*—Étude sur les courants et sur la température des eaux de la mer dans l'Océan Atlantique.

*Schück, A.*—Die Kompass-Sage in Europa (Flavio Gioja), die ersten Erwähnungen desselben dortselbst und nationale Ansprüche an seine Erfindung.

*Bombay, Government Observatory.*—Report on the condition and proceedings of the Government Observatory, Colába, for the year which ended with the 30th June 1892.

*Toronto, Meteorological Service.*—Report. 1888.

*Oettingen, A. von.*—Meteoorologische Beobachtungen angestellt in Dorpat im Jahre 1891.

*Stuttgart, Meteorologische Centralstation.*—Deutsches meteorologisches Jahrbuch. Jahrg. 1891. Meteorologische Beobachtungen in Württemberg.

*Hann, J.* Weitere Untersuchungen über die tägliche Oscillation des Barometers.

*Calcutta Meteorological Office.*—Meteorological observations recorded at seven stations in India in the year 1891.

63, *Victoria Street*, November 16, 1892.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON.  
PROFESSOR DARWIN.

| MR. STONE.  
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 2) were read and confirmed.

Read—Letter 2003 from Mr. R. FitzGerald declining to accept Mr. Carroll as arbitrator in the matter of the dilapidations at the old Valencia Observatory (Minutes, p. 45). Mr. Scott was instructed to consult Mr. Few as to the liability of the Council in the matter.

Mr. Scott reported that in a review of the recent publication of the Office, “Ten “ Years Sunshine in the British Islands,” (Letter 2039) a request had been made that the sunshine should be tabulated hourly.

The Council were not of opinion that this should be carried out.

Mr. Scott reported that he had completed the extraction of the reports of “fog” and “mist” for the Telegraphic Reporting Stations, 1876–90, and that the reports of mist showed such discrepancies between adjacent stations that he did not consider them worth publication.

He was authorized to examine the reports from the Stations of the Second Order, on the south coast, such as Southampton, in order to see how far the results agreed with those for the Telegraphic Stations.

Read—Letter 2019 from the Royal Horticultural Society applying for copies of the Daily Weather Report since January 1, 1890.—Granted.

Mr. Scott reported that in the month of July (Letters 1371 and 1428), by instructions from the Chairman, some apparatus had been forwarded from the Office to Professor Henrici, F.R.S., for exhibition at a proposed meeting of the German Mathematical Association to be held at Nuremberg in September. Mr. Scott had recently learnt from Professor Henrici (Letter 1949) that the meeting at Nuremberg had not taken place, and by the Chairman’s instructions he had written (P.C. 1989) to Professor Henrici to request that the apparatus, &c. should be returned at once. Professor Henrici had replied (Letter 1952) that he had written to Germany to that effect.

Read—Letter 1943, from Lloyds, stating that they had agents in Pacific Islands, at—

Fiji, Samoa, Tahiti, the Sandwich Islands, and New Caledonia.

Mr. Scott was instructed to ask if these gentlemen, except those in Fiji, whence observations are at present published, would be disposed to observe for the Office (P.C. 2070).

Read—Letter 1991, from the executors of the late Professor Grant, asking if the allowance to Glasgow Observatory would be continued until the appointment of the new professor. Mr. Scott stated that he had replied in the affirmative (P.C. 2037).

Read a letter from Mr. Baillie, stating that since last meeting four logs had been received, two of them being “excellent.” Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Read—Letter 2088, from Mr. Stone, stating that the anemometer at the Radcliffe Observatory was worn out.

The Council agreed to contribute 40% towards the cost of a new anemometer, the instrument to belong to the Observatory. The old one to be returned to the Office.

Submitted—The following report on the 8.30 p.m. forecasts for October 1892 :—

The letters used have the following signification :—

a=complete success.

b=partial (i.e., more than half) success.

c=partial failure.

d=total failure.

OCTOBER 1892.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 26            | 49       | 38                   | 83                                   |
| "                | b | 55            | 35       | 45                   |                                      |
| "                | c | 13            | 10       | 11                   |                                      |
| "                | d | 6             | 6        | 6                    |                                      |
| SCOTLAND, E.     | a | 29            | 74       | 52                   | 81                                   |
| "                | b | 49            | 10       | 29                   |                                      |
| "                | c | 16            | 6        | 11                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| ENGLAND, N.E.    | a | 42            | 61       | 52                   | 91                                   |
| "                | b | 49            | 29       | 39                   |                                      |
| "                | c | 6             | 10       | 8                    |                                      |
| "                | d | 3             | 0        | 1                    |                                      |
| ENGLAND, E.      | a | 19            | 58       | 39                   | 73                                   |
| "                | b | 48            | 20       | 34                   |                                      |
| "                | c | 10            | 16       | 13                   |                                      |
| "                | d | 23            | 6        | 14                   |                                      |
| MIDLAND COUNTIES | a | 23            | 45       | 34                   | 68                                   |
| "                | b | 35            | 32       | 34                   |                                      |
| "                | c | 23            | 23       | 23                   |                                      |
| "                | d | 19            | 0        | 9                    |                                      |
| ENGLAND, S.      | a | 36            | 65       | 51                   | 75                                   |
| "                | b | 32            | 16       | 24                   |                                      |
| "                | c | 26            | 16       | 21                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| SCOTLAND, W.     | a | 39            | 55       | 47                   | 74                                   |
| "                | b | 35            | 19       | 27                   |                                      |
| "                | c | 16            | 13       | 15                   |                                      |
| "                | d | 10            | 13       | 11                   |                                      |
| ENGLAND, N.W.    | a | 39            | 58       | 49                   | 91                                   |
| "                | b | 52            | 32       | 42                   |                                      |
| "                | c | 3             | 7        | 5                    |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| ENGLAND, S.W.    | a | 42            | 65       | 54                   | 84                                   |
| "                | b | 45            | 16       | 30                   |                                      |
| "                | c | 3             | 10       | 7                    |                                      |
| "                | d | 10            | 9        | 9                    |                                      |
| IRELAND, N.      | a | 23            | 68       | 46                   | 80                                   |
| "                | b | 45            | 23       | 34                   |                                      |
| "                | c | 16            | 3        | 9                    |                                      |
| "                | d | 16            | 6        | 11                   |                                      |
| IRELAND, S.      | a | 23            | 52       | 38                   | 73                                   |
| "                | b | 42            | 29       | 35                   |                                      |
| "                | c | 16            | 13       | 15                   |                                      |
| "                | d | 19            | 6        | 12                   |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 31            | 59       | 45                   | 79                                   |
| "                | b | 44            | 24       | 34                   |                                      |
| "                | c | 14            | 11       | 13                   |                                      |
| "                | d | 11            | 6        | 8                    |                                      |

Submitted:—The following statement respecting the Records for January to June, 1892, received from the Self-recording Observatories (see Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889):—

| JANUARY-JUNE.                                                                        | ABERDEEN.          |           | ARMAGH.            |           | FALMOUTH.            |           | FORT WILLIAM.      |             | KEW.       |           | VALENCIA.  |           |
|--------------------------------------------------------------------------------------|--------------------|-----------|--------------------|-----------|----------------------|-----------|--------------------|-------------|------------|-----------|------------|-----------|
| <b>ANEMOGRAPH :—</b>                                                                 | Direction.         | Velocity. | Direction.         | Velocity. | Direction.           | Velocity. | Direction.         | Velocity.   | Direction. | Velocity. | Direction. | Velocity. |
| <i>Action of Instrument</i> -                                                        | Good.              | Good.     | Bad to             | Fair to   | Good.                | Good.     | —                  | —           | Good.      | Good.     | Good.      | Good.     |
| <i>Records deficient :—</i>                                                          |                    |           | Good.              | Good.     |                      |           |                    |             |            |           |            |           |
| Due to stoppage of clock                                                             | 0                  | 0         | 2 hrs.             | 5 hrs.    | 0                    | 0         | —                  | —           | 0          | 0         | 9 hrs.     | 8 hrs.    |
| „ other causes -                                                                     | 0                  | 0         | 1,883 hrs.         | 9 hrs.    | 0                    | 0         | —                  | —           | 3 hrs.     | 38 hrs.   | 98 hrs.    | 97 hrs.   |
| <i>No. of errors discovered :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| By general examination                                                               | 0                  | 1         | 6                  | 21        | 0                    | 1         | —                  | —           | 2          | 2         | 8          | 8         |
| <i>Rsults. of 40 Remeasmts. :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Greatest difference -                                                                | 1·0                | 1·0       | 1·0                | 2·0       | 1·0                  | 1·0       | —                  | —           | 1·0        | 2·0       | 1·0        | 3·0       |
| Mn. diff. irrespectv. of sign                                                        | 0·3                | 0·5       | 0·2                | 0·5       | 0·2                  | 0·5       | —                  | —           | 0·2        | 0·7       | 0·1        | 0·5       |
| Residual diff. (— M. O.) -                                                           | 0·0                | 0·0       | 0·0                | 0·0       | 0·0                  | 0·0       | —                  | —           | -0·1       | +0·1      | +0·1       | -0·1      |
| <i>Orientation verified</i> -                                                        | Monthly            | —         | Monthly            | —         | Monthly              | —         | —                  | —           | Monthly    | —         | Monthly    | —         |
| <b>RAIN-GAUGE :—</b>                                                                 |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.              |           | Good.              |           | Good.                |           | Good.              |             | Good.      |           | Good.      |           |
| <i>Records deficient :—</i>                                                          |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Due to stoppage of clock                                                             | 0                  |           | 13 hrs.            |           | 0                    |           | 10 hrs.            |             | 0          |           | 27 hrs.    |           |
| „ other causes -                                                                     | 0                  |           | 0                  |           | 8 hrs.               |           | 0                  |             | 2 hrs.     |           | 22 hrs.    |           |
| <i>No. of errors discovered :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| By general examination                                                               | 4                  |           | 3                  |           | 0                    |           | 9                  |             | 5          |           | 5          |           |
| —                                                                                    | ABERDEEN.          |           | FALMOUTH.          |           | FORT WILLIAM.        |           | KEW.               |             | VALENCIA.  |           |            |           |
| <b>BAROGRAPH :—</b>                                                                  |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.              |           | Good.              |           | Good.                |           | Good.              |             | Good.      |           | Good.      |           |
| <i>Character of Photography</i>                                                      | Do.                |           | Good to Excellent. |           | Indifferent to Good. |           | Fair to Excellent. |             | Fair.      |           | Fair.      |           |
| <i>Records deficient :—</i>                                                          |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Due to stoppage of clock                                                             | 0                  |           | 0                  |           | 0                    |           | 0                  |             | 1 hr.      |           | 1 hr.      |           |
| „ failure of light -                                                                 | 0                  |           | 0                  |           | 0                    |           | 10 hrs.            |             | 2 hrs.     |           | 2 hrs.     |           |
| „ other causes -                                                                     | 0                  |           | 0                  |           | 0                    |           | 2 hrs.             |             | 25 hrs.    |           | 25 hrs.    |           |
| <i>No. of errors discovered :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| In entry of standards -                                                              | 0                  |           | 0                  |           | 7                    |           |                    |             | 5          |           | 5          |           |
| „ calculating residuals -                                                            | 0                  |           | 4                  |           | 4                    |           |                    |             | 2          |           | 2          |           |
| „ applying „ -                                                                       | 1                  |           | 2                  |           | 12                   |           | 2                  |             | 13         |           | 13         |           |
| „ maxima and minima -                                                                | 0                  |           | 3                  |           | 10                   |           | 6                  |             | 2          |           | 2          |           |
| By general examination -                                                             | 87                 |           | 5                  |           | 95                   |           | 37                 |             | 109        |           | 109        |           |
| <i>Rsults. of 40 Remeasmts. :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Greatest difference -                                                                | ·010               |           | ·009               |           | ·006                 |           | ·009               |             | ·007       |           | ·007       |           |
| Mn. diff. irrespectv. of sign                                                        | ·003               |           | ·002               |           | ·002                 |           | ·002               |             | ·002       |           | ·002       |           |
| Residual diff. (— M. O.) -                                                           | + ·001             |           | + ·001             |           | ·000                 |           | + ·001             |             | ·000       |           | ·000       |           |
| <i>Mean monthly diff. between simultaneous Barogrph. and Stand. Bar. readings</i> -  | ·001               |           | ·002               |           | ·002                 |           | ·002               |             | ·002       |           | ·002       |           |
| <b>THERMOGRAPH :—</b>                                                                |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| <i>Action of Instrument</i> -                                                        | Good.              |           | Good.              |           | Good.                |           | Good.              |             | Good.      |           | Good.      |           |
| <i>Character of Photography</i>                                                      | Good to Excellent. |           | Do.                |           | Do.                  |           | Do.                |             | Fair.      |           | Fair.      |           |
| <i>Records deficient :—</i>                                                          |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Due to stoppage of clock                                                             | Dry. 0             | Wet. 0    | Dry. 0             | Wet. 0    | Dry. 0               | Wet. 0    | Dry. 5 hrs.        | Wet. 5 hrs. | Dry. 0     | Wet. 0    | Dry. 0     | Wet. 0    |
| „ failure of light -                                                                 | 1 hr.              | 0         | 0                  | 0         | 0                    | 0         | 0                  | 0           | 10 hrs.    | 8 hrs.    | 10 hrs.    | 8 hrs.    |
| „ impetely. moist. bulbs                                                             | —                  | 30 hrs.   | —                  | 9 hrs.    | —                    | 171 hrs.  | —                  | 105 hrs.    | —          | 52 hrs.   | —          | 52 hrs.   |
| „ partly. frozen bulbs                                                               | —                  | 211 hrs.  | —                  | 100 hrs.  | —                    | 101 hrs.  | —                  | 120 hrs.    | —          | 54 hrs.   | —          | 54 hrs.   |
| „ other causes -                                                                     | 0                  | 0         | 0                  | 1 hr.     | 0                    | 0         | 10 hrs.            | 11 hrs.     | 247 hrs.   | 246 hrs.  |            |           |
| <i>No. of errors discovered :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| In entry of standards -                                                              | 2                  | 0         | 4                  | 1         | 8                    | 23        | 1                  | 2           | 18         | 11        |            |           |
| „ maxima and minima -                                                                | 4                  | —         | 5                  | —         | 13                   | —         | 8                  | —           | 4          | —         |            |           |
| By general examination -                                                             | 8                  | 7         | 4                  | 4         | 13                   | 24        | 10                 | 11          | 21         | 17        |            |           |
| <i>Rsults. of 40 Remeasmts. :—</i>                                                   |                    |           |                    |           |                      |           |                    |             |            |           |            |           |
| Greatest difference -                                                                | 0·2                | 0·2       | 0·3                | 0·2       | 0·3                  | 0·6       | 0·2                | 0·2         | 0·6        | 0·4       |            |           |
| Mn. diff. irrespectv. of sign                                                        | 0·1                | 0·1       | 0·1                | 0·1       | 0·1                  | 0·4       | 0·1                | 0·1         | 0·1        | 0·1       |            |           |
| Residual diff. (— M. O.)                                                             | 0·1                | 0·0       | + 0·1              | + 0·1     | + 0·1                | + 0·1     | 0·0                | 0·0         | + 0·1      | + 0·1     |            |           |
| <i>Mean monthly diff. between simultaneous Thermogrph. and Stand. Ther. readings</i> | 0·2                | 0·2       | 0·2                | 0·2       | 0·1                  | 0·2       | 0·1                | 0·2         | 0·2        | 0·3       |            |           |

## ANEMOGRAMS.

*Aberdeen.*—The instrument worked satisfactorily throughout the period and the bearings were kept well oiled.

*Armagh.*—Doubt having arisen as to the action of the *Direction* vane, an examination of the instrument took place on March 5th, when it was found that the shaft "had stuck so fast that we could not raise it" (see M.O. 532). The local surroundings have always affected the direction and velocity results to a greater or less extent, rendering it somewhat difficult to judge as to the correct working of the instrument, but strict examination has led to the rejection of the observations from 11 a.m., January 11th, to 7 p.m., March 29th, when the instrument was re-started after being thoroughly overhauled and cleaned under Mr. Whipple's supervision. From the appearance of the traces in June, some part of the instrument was apparently loose, and attention was called thereto. The slight mechanical defect in the *Velocity* pencil still causes the traces to be intermittent at low rates.

*Falmouth.*—The instrument worked satisfactorily throughout the period, and the bearings were oiled regularly.

*Kew.*—Great trouble is experienced at this Observatory with the pricker attached to the instrument for the purpose of checking the times of starting and stopping the sheets (see previous reports). This occurred occasionally during the period under notice, and on June 1st a new pricker was fitted (see M.O. 1131), but matters were not finally adjusted until June 16th, when it was found that the worm of the screw by which the pricker was fastened was very much worn and a new screw was substituted. Attention having been drawn to the serrated appearance of the *Velocity* traces in January and February, an examination was made which led to the cylinder being more tightly geared on the 16th of the latter month. The exposed parts of the instrument were oiled monthly.

*Valencia.*—The instrument was dismantled for removal to Westwood House, Cahirciveen, at 3 p.m. on March 7th, and having been placed in position, observations were resumed at 12.10 p.m. on the 10th. On June 26th "screwed-up fitting of clock to reduce backlash and shaky trace." Bearings regularly oiled.

## RAIN-GAUGES.

*Aberdeen.*—The action of the instrument in January was occasionally unsatisfactory, and it was found "that the side of the pipe was in contact with check and pencil thus pushed down." This was remedied, and the subsequent action of the instrument was satisfactory.

*Armagh.*—The instrument worked satisfactorily throughout the period. The close agreement between the amounts given by the two gauges is remarkable.

*Falmouth.*—On February 2nd the binding screw broke. The traces are very good.

*Fort William.*—Occasionally the discharges fall short on the curve, thereby rendering the hourly values doubtful. In February attention was drawn to the differences between the amounts collected in the Beckley gauge, as shown by trace and measurement in the glass. The instrument was examined on June 1st.

*Kew.*—The experiments which were conducted at this Observatory between April 29th and September 19th, 1891, with the view of obtaining an improved marking medium, and subsequently found necessary to extend for the purpose of discovering a substitute for the paper in use, were resumed in February and continued throughout the period, with fairly satisfactory results. (See M.O. 931 and 994, 1892).

*Valencia.*—New line fitted to clock on January 31st. The instrument was dismantled for removal to Westwood House at 2 p.m., March 18th, and started on the new site at 12.40 p.m. of the 19th. During May and June the attachment of the papers was not good, and the traces occasionally were very coarse, caused by want of attention to the pointing of the pencils.

## BAROGRAMS.

*Aberdeen.*—The light stop caused a slight amount of trouble during June, otherwise there was no defect.

*Falmouth.*—The action of the instrument was very good, and the photography left nothing to be desired.

*Fort William.*—On January 15th–18th the traces show numerous fluctuations of pressure probably due to local peculiarities. The tube of the instrument was lowered by .324 in. at 0.47 p.m. on February 13th, and restored to its previous position at 10.22 a.m. on 14th. Again lowered at 11.6 p.m. on March 22nd until 10.21 a.m. of the 24th. In many of the curves there is evidence of imperfections in the photography.

*Kew.*—The tube of the instrument was slightly shifted in order to inspect the air-hole on May 19th. Slight blurring to lower edge of trace occasionally.

*Valencia.*—Instrument dismantled at 5.25 p.m. on March 15th, and started at the new observatory at 11.50 a.m. of the 23rd. During the interval, the hourly values were approximated at the M.O. from measurements of the trace by the Richard instrument corrected by the readings of the standard barometer, taken at the old observatory. The photography at Westwood House left much to be desired, and the imperfect action of the light stop caused some amount of inconvenience, which led to the cylinder being removed on May 9th in order to admit of the examination of the shutter arrangements. The regulation of the light also was very unequal during the latter part of the period.

## THERMOGRAMS.

*Aberdeen*.—It was found necessary to re-focus the instrument at 10.22 a.m. on February 20th on account of the low temperature. Zero lines changed from winter to summer positions on June 1st.

*Falmouth*.—Zero lines changed from winter to summer positions on May 10th. Work very satisfactory.

*Fort William*.—New scale and zero-line values used after 10 a.m., January 3rd. There was a want of agreement, however, between the measurements of the wet-bulb made at the observatory and the M.O. (see Table), and attention was repeatedly drawn to the fact. The zero lines were changed from the winter to the summer positions on May 12th.

*Kew*.—The instrument was re-focussed on February 18th. Considerable difficulty was experienced in maintaining a sufficient coating of ice round the wet-bulbs owing to rapid evaporation. The flaw on the tube of the wet-bulb caused serious interference with the trace at certain temperatures, and on May 16th the tube was removed and re-blackened with satisfactory results. The shield was altered to extend the range of low temperatures on the same date, and the zero lines were changed from the winter to the summer positions on the 24th. New zero-line values were calculated and used, the lower ( $19^{\circ}5$ ) from 7 p.m., 16th May, and the upper ( $74^{\circ}6$ ) on and after 11 a.m., 24th. The instrument was examined on June 27th.

*Valencia*.—Instruments dismounted and removed to Westwood House at 3.22 p.m. on March 10th, and observations commenced at the new observatory at 11 a.m. of the 19th. The photography was subsequently the cause of anxiety, and the imperfect action of the light stop caused the loss of some hours of trace during March. The breadth of the traces also varied greatly. The zero lines were changed from winter to summer positions on June 9th, and the dots raised on the 17th.

## GENERAL.

To want of care may most of the imperfections be traced. When once attention is drawn to any defect in the working of the instruments or other part of the work, the cause should be promptly ascertained and the imperfection remedied; the length of time, however, occupied in detecting the cause and the oftentimes simple character of the defect, tend to show that sufficient notice is not given to the criticisms in the "Notes of Errors."

The close agreement between the readings of the barograph and standard barometer, irrespective of a rapid increase or decrease of pressure, and shown at several of the observatories, is very remarkable.

(Signed) THOMAS ED. ALLEN.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

## 1. WARNINGS ISSUED.

*Summary.*

|                    |   |   |   |   |               |
|--------------------|---|---|---|---|---------------|
| A + B (successful) | - | - | - | = | 24 districts. |
| C (failures)       | - | - | - | = | 7 districts.  |

## 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
16th November 1892.

Submitted—The following statement of accounts :—

|                                    | £     | s. | d. |
|------------------------------------|-------|----|----|
| Cash balance 1st November          | -     | -  | -  |
| Receipts from 2nd to 15th November | -     | -  | -  |
|                                    | 3,915 | 1  | 3  |
|                                    | 21    | 16 | 0  |
|                                    | 3,936 | 17 | 3  |
| Cheques drawn                      | -     | -  | -  |
|                                    | 68    | 8  | 3  |
|                                    | 3,868 | 9  | 0  |

Professor Darwin was appointed auditor for the current year.

Submitted—The following list of publications which had been received since the last meeting :—

*Rotch, L.*—Sur la mesure des hauteurs et des vitesses des nuages à l'observatoire de Blue-Hill (États-Unis).

*Foerster, W., und Jesse, O.*—Aufforderung zu Beobachtungen der leuchtenden Nachtwolken.

*Eberswalde, Hauptstation des forstlichen Versuchswesen in Preussen.*—Jahresbericht über die Beobachtungs Ergebnisse der von den forstlichen Versuchsanstalten des Königreichs Preussen, . . . eingerichteten forstlich-meteorologischen Stationen. 1891.

*Harvey, C. W.*—Summary of meteorological observations of temperature and rainfall taken at Throcking Rectory, Buntingford, Herts. 1880–89.

*Frankfurt am Main, Physikalischer Verein.*—Jahresbericht . . . für das Rechnungsjahr 1890–1891.

*Ballou, S. M.*—The eye of the storm.

*Davis, W. M.*—The Lawrence tornado of July 26, 1890. The features of tornadoes and their distinction from other storms.

*Clayton, H. H.*—The Lawrence tornado.

*Mills, H. F.*—Evidence of vorticular motion in the Lawrence tornado.

*Henrici, O.*—Harmonischer Analysator.

— Über Instrumente zur harmonischen Analyse.

*Copenhagen, Kongelige Danske Videnskabernes Selskab.*—Fortegnelse over de af det K. Danske Videnskabernes Selskab i Tidsrummet 1742–1891 udgivne videnskabelige Arbejder.

63, Victoria Street, November 30, 1892.

PRESENT :

MR. GALTON IN THE CHAIR.

MR. BUCHAN.

|

MR. STONE.

PROFESSOR DARWIN.

The Secretary was in attendance.

The Minutes of the last meeting (November 16) were read and confirmed.

Reported—That the instruments sent to the proposed exhibition at Nuremberg (Minutes, p. 52) had been received from Professor Henrici on the 25th instant, in good condition.

Mr. Scott reported that on the 18th instant he had gone to Mr. Few's office relative to the dilapidations at Valencia, and he submitted Mr. Few's letter of the 19th (M.O. 2049), recommending that Mr. Fitzgerald should be invited to submit names of arbitrators who would be accepted by him. This had been done (P.C. 2088). A reply had been received submitting five names (M.O. 2075), and Mr. Cullum had been requested to state what he knew of these men (P.C. 2108). Messrs. Few had also been requested to give further instructions in the matter of the arbitration (P.C. 2104), and their reply had been received (M.O. 2084) and was submitted.—Action approved.

Read—Letter 2050, from Dr. Nansen, requesting that copies, on tracing paper, of the currents in the Arctic Regions, North of Lat. 60° N., which were in the Office, might be supplied to him to aid him in his proposed expedition.—Request granted.

Mr. Scott reported that owing to the serious and prolonged illness of Mr. Whipple, no inspection of the English and Scotch observatories had been made in the current year, as Mr. Baker had been unable to leave Kew Observatory.

Read—Letter 2040, from Mr. Munro, stating that the new anemometer, ordered Minutes, p. 30, had been completed, and making certain suggestions as to its erection.—Referred to Mr. Dines (P.C. 2138).

Mr. Scott submitted an *ad interim* report from Mr. Gaster (M.O. 2111), on the proposed scheme of publication of rain-tables (Minutes, p. 25), being a map for the counties lying in England south-east. Mr. Scott was instructed to have the maps completed for the entire area.

Read—A letter from Mr. Baillie stating that since last meeting three logs had been received, two of them being "excellent."

Mr. Scott was instructed to present the Charts O. 27 to Captain Tait, S.S. "India," and to convey the best thanks of the Council to the other observers.

Submitted—The following summary as a result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

(1.) WARNINGS ISSUED.

|                    |   |   |   |   |   |               |
|--------------------|---|---|---|---|---|---------------|
| A + B (successful) | - | - | - | - | = | 25 districts. |
| C (failures)       | - | - | - | - | = | 9 districts.  |

(2.) GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

Telegraphic Branch,

30th November 1892.

(Signed) FREDC. GASTER.

Submitted—The following statement of accounts:—

|                                          | £            | s.       | d.       |
|------------------------------------------|--------------|----------|----------|
| Cash balance on 15th November            | 3,868        | 9        | 0        |
| Receipts from 16th to 30th November      | 12           | 0        | 0        |
|                                          | <u>3,880</u> | <u>9</u> | <u>0</u> |
| Cheques drawn from 16th to 30th November | 924          | 1        | 3        |
|                                          | <u>2,956</u> | <u>7</u> | <u>9</u> |
| Balance on 30th November                 |              |          |          |

Submitted—The following list of publications which had been received since the last meeting:—

*Mauritius, Royal Alfred Observatory.*—Meteorological observations taken during the year 1891.

*Wild, H.*—Instrument für erdmagnetische Messungen und astronomische Ortsbestimmungen auf Reisen.

*Washington, U. S. Naval Observatory.*—Magnetic observations. 1891.

— Meteorological observations and results. 1888.

*Dorpat, Kaiserliche livländische gemeinnützige und ökonomische Sozietät.*—Bericht über die Ergebnisse der Beobachtungen an den Regenstationen . . . für die Jahre 1889, 1890 und 1891.

*Duponchel, A.*—La circulation des vents et de la pluie dans l'atmosphère.

*San Fernando, Instituto y Observatorio de Marina.*—Anales. Sección 2<sup>a</sup>. Observaciones meteorológicas y magnéticas. Año 1891.

*Colombo, Surveyor General's Office.*—Return of rainfall in Ceylon during 1891, and the means during different periods.

*Copenhagen, Dansk Meteorologisk Institut.*—Meteorologisk Aarbog. 1888, 1889, 1890, i., iii., 1891, i., iii.

*Sydney Observatory.*—Results of meteorological observations made in New South Wales during 1880–1884. 2 vols.

*Russell, H. C.*—Physical geography and climate of New South Wales. Second edition.

— President's address delivered to the Royal Society of N. S. Wales, May 4, 1892.

63, Victoria Street, December 14, 1892.

PRESENT :

MR. GALTON IN THE CHAIR.

PROFESSOR DARWIN.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 30) were read and confirmed.

Reported (Minutes, p. 57)—That Mr. Cullum (Letter 2115) had stated that Mr. J. Healy, whose name had been mentioned by Mr. FitzGerald, had been already engaged in large contracts, and that accordingly Mr. Galton had decided to accept him as arbitrator, and the following letter was addressed to Mr. FitzGerald :—

(P.C. 2168.)

DEAR SIR,

December 7, 1892.

I AM instructed by the Meteorological Council to inform you, in reply to your letter of the 23rd ultimo, that they are prepared to accept Mr. John Healy, of Tralee, as umpire, and agree to be bound by his decisions, on your giving to them a like assurance, and after hearing from you that Mr. Healy will undertake the duty, and the way in which his expenses are to be met shall have been decided. The surveyors on either side would then put their views before him.

The Council are informed by their legal advisers that it is usual for the expenses of an umpire to be shared between the two parties ; if, however, you are not willing to undertake beforehand to bear one half of the umpire's expenses, they suggest that it should be left to him to say upon which of the two parties, yourself and the Meteorological Council, or in what proportion between them, his expenses should fall, and that both parties should agree to abide by his decision.

It will then be necessary to put the facts before the umpire, showing what you have claimed and what the Meteorological Council offered in order to settle the matter.

In dealing with the costs the umpire would take these facts into consideration.

I am desired to ask you which of the two alternatives you will accept, that of an equal partition of costs, or that of leaving the costs to the decision of the umpire.

Our advisers informed us that, as the agreement under which the Office was in occupation of the Valencia House provided that the tenants should keep the premises in good and sufficient repair during the term, damage by fire or other inevitable accident only excepted, and contained no other provision as to repairing or painting or delivering up at the end of the term in good repair, it seemed to them that the landlord was claiming much more than he is entitled to.

They added that where a lessee covenants to keep old premises in repair, he is not liable for such dilapidations as result from the natural operations of time and elements.

Yours, &c

(Signed) ROBERT H. SCOTT.

To Robert FitzGerald, Esq.,  
Grand Jury Secretary's Office, Tralee.

Mr. FitzGerald had sent the following reply :—

(M.O. 2075.)

DEAR SIR,

Grand Jury Secretary's Office,

December 9, 1892.

IN reply to yours of 7th instant, I write to say that I agree to be bound by the decision of Mr. John Healy as umpire in the case referred to, and that Mr. Healy should decide by whom his expenses are to be borne. I have seen Mr. Healy, and he is willing to act in the matter.

Yours, &c.

(Signed) R. FITZGERALD.

Robert H. Scott, Esq.,  
63, Victoria Street, London, S.W.

The correspondence thus far was approved.

It was decided, before making final arrangements, that Messrs. Healy be asked as to their scale of charges (P.C. 2217), and that Mr. FitzGerald be informed that the Council had done so (P.C. 2216).

If the charges are thought satisfactory by Mr. Galton the arbitration is to be definitely agreed to. A draft of a letter to Mr. Healy was also agreed to.

Mr. Scott stated that on June 20 he had received from Messrs. Few (Letter 1180) a request that the Council should sign some form of indemnity to the Royal Society for the rent, &c. of Westwood House, and that he had replied (P.C. 1193) requesting Messrs. Few to draw up such a form of indemnity.

On the 13th instant (Letter 2175) Messrs. Few had forwarded such a form.

Consideration was postponed until a full meeting of the Council.

Mr. Scott reported that he had learned (Letter 2130) that Mr. Hugh Williams, who had been in charge of the anemometers at Holyhead since 1869, would retire on the 21st of January.

Mr. Scott reported that the Colonial Office (Letter 1922, 1891) had forwarded some diagrams of meteorological results on a very large scale from stations on the Gold Coast, and he submitted a memorandum from Mr. J. Curtis, accompanying copies of the diagrams on a reduced scale suitable for lithography.

It was decided to forward these to the Colonial Office (P.C. 2231).

Reported (Minutes, p. 57)—That Mr. Dines had recommended that the anemometer be erected temporarily on the roof of the Office, and that this recommendation would be carried out after Christmas.

Submitted—A memorandum from the Royal Meteorological Society stating that the cost of illustrating the two papers forwarded to them (Minutes, 1891, pp. 79 and 83) had been :—

|                                    | £     | s. | d. |
|------------------------------------|-------|----|----|
| For the West India hurricane - - - | 0     | 15 | 0  |
| „ Mr. Dines's report - - -         | 5     | 3  | 0  |
|                                    | <hr/> |    |    |
|                                    | £5    | 18 | 0  |
|                                    | <hr/> |    |    |

—Payment sanctioned.

Mr. Scott reported that the sea temperature observations on the coasts of the British Isles would cease on the 31st instant (Letter 2262, 1889), and he was instructed to write to the Admiralty to request their continuance (P.C. 2219).

Read—A letter from Mr. Baillie, stating that since last meeting five logs had been received, two of them being “excellent.” Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Resolved—That the usual bonus of 3*l.* 3*s.* 0*d.* be given to those of the telegraphic reporters who have discharged their duties satisfactorily during the year.—(Minutes, 1891, p. 51.)

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

#### 1. WARNINGS ISSUED.

|                    |   |   |   |   |                 |
|--------------------|---|---|---|---|-----------------|
| A + B (successful) | - | - | - | - | = 31 districts. |
| C (failures)       | - | - | - | - | = 15 „          |

#### 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

A local gale in the Straits of Dover on December 9th, caused by very sudden advance of a depression from the north-westward. This could not be foreseen.

Telegraphic Branch.

(Signed) FREDC. GASTER.

Submitted—The following reports of work during the month of November 1892 :—

#### MARINE BRANCH.

December 13, 1892.

Examined 7 new logs.

Discussion of the data for the district between the Cape of Good Hope and New Zealand. Grouping the winds into homogeneous areas and collecting information on ice and whales.

Various work in connexion with the final preparation of the Red Sea wind and current charts for lithographic reproduction. The wind charts submitted to the Hydrographer.

Charting, from all available sources, information bearing on currents in the Arctic regions.

Preparing monthly sea temperature charts for the portion of the North Atlantic westward of the British Isles.

The Marine Superintendent.

(Signed) CHAS. HARDING.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

## TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 30th November 1892.)

*Quarterly Weather Report, 1881 :—*

1st quarter ; about four-fifths done.

2nd „ ; tables and rough maps prepared.

*Weekly Weather Report, 1892 :—*

All numbers issued promptly.

*Monthly Summaries.*—Tables, &c. prepared to end of October.*Appendices* well in hand.*Daily Weather Report, 1892 :—*

All numbers issued to date.

Corrections and addition sheet for October issued.

*Primary Checking of Storm Warnings Issued.*—Done to date.*Checking of 8.30 p.m. Forecasts.*—Done to date.*Checking of Hay Harvest Forecasts.*—Checking completed. Preparation of summary in hand.*Selecting and Plotting of Rainfall Stations,* showing annual values for 1881–90.

Final plotting done for Ireland and Scotland.

„ in hand.—England.

(Signed) FREDC. GASTER.

Telegraphic Branch,

14 December 1892.

## PANTAGRAPH ROOM.

December 1, 1892.

*Hourly Means.*—Some of the sheets of “*Hourly Means*” from 1890 have been revised and signed for press, but there has been a good deal of delay on the part of the printer.

The preparation of the various mean values for 1891 has made steady progress.

The ordinary routine work of the Room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

## EXAMINATION BRANCH.

December 1, 1892.

*Examinations.**July, 1890–July, 1891.*—Times and values of the daily *maxima* and *minima* atmospheric pressures for Fort William.*April–July, 1891.*—Times and values of the daily *maxima* and *minima* atmospheric pressures for Aberdeen, Falmouth and Valencia.*July and August, 1892.*—Completed.

Weekly examination (on receipt) of curves and documents from all observatories.

*Reports.**January–June, 1892.*—Reports on the work for each month, and combined report for Council.On the experiments made at Kew Observatory *re* paper and marking medium for rain-gauge curves.*Miscellaneous.**Diurnal Range of Rainfall, 1871–1890.*—Examining and correction of the hourly values, 1885 and 1886.Preparing “*Diary of Operations*” for 1893, and correcting proof and revise of same.

Revising Forms Nos. 23, 24, and 28, and correcting proof of same.

General routine work.

(Signed) T. E. ALLEN.

## Submitted the following statement of accounts :—

|                                             | £     | s. | d. |
|---------------------------------------------|-------|----|----|
| Cash balance on 30th November - -           | 2,956 | 7  | 9  |
| Receipts from 1st to 13th December - -      | 4     | 0  | 8  |
|                                             | 2,960 | 8  | 5  |
| Cheques drawn from 1st to 13th December - - | 37    | 8  | 0  |
|                                             | 2,923 | 0  | 5  |
| Balance on 13th December - -                |       |    |    |

Submitted—The following report on the 8.30 p.m. forecasts for November 1892 :—

The letters used have the following signification :—

a = complete success.

b = partial (*i.e.*, more than half) success.

c = partial failure.

d = total failure.

NOVEMBER 1892.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 30            | 60       | 45                   | 74                                   |
| "                | b | 37            | 20       | 29                   |                                      |
| "                | c | 20            | 10       | 15                   |                                      |
| "                | d | 13            | 10       | 11                   |                                      |
| SCOTLAND, E.     | a | 33            | 57       | 45                   | 72                                   |
| "                | b | 27            | 27       | 27                   |                                      |
| "                | c | 33            | 10       | 22                   |                                      |
| "                | d | 7             | 6        | 6                    |                                      |
| ENGLAND, N.E.    | a | 54            | 47       | 51                   | 79                                   |
| "                | b | 30            | 27       | 28                   |                                      |
| "                | c | 13            | 10       | 12                   |                                      |
| "                | d | 3             | 16       | 9                    |                                      |
| ENGLAND, E.      | a | 37            | 63       | 50                   | 85                                   |
| "                | b | 53            | 17       | 35                   |                                      |
| "                | c | 7             | 17       | 12                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| MIDLAND COUNTIES | a | 44            | 53       | 49                   | 84                                   |
| "                | b | 43            | 27       | 35                   |                                      |
| "                | c | 10            | 13       | 11                   |                                      |
| "                | d | 3             | 7        | 5                    |                                      |
| ENGLAND, S.      | a | 50            | 53       | 52                   | 84                                   |
| "                | b | 37            | 27       | 32                   |                                      |
| "                | c | 10            | 13       | 11                   |                                      |
| "                | d | 3             | 7        | 5                    |                                      |
| SCOTLAND, W.     | a | 57            | 47       | 52                   | 72                                   |
| "                | b | 17            | 23       | 20                   |                                      |
| "                | c | 16            | 17       | 17                   |                                      |
| "                | d | 10            | 13       | 11                   |                                      |
| ENGLAND, N.W.    | a | 33            | 47       | 40                   | 67                                   |
| "                | b | 30            | 23       | 27                   |                                      |
| "                | c | 27            | 17       | 22                   |                                      |
| "                | d | 10            | 13       | 11                   |                                      |
| ENGLAND S.W.     | a | 40            | 60       | 50                   | 70                                   |
| "                | b | 30            | 10       | 20                   |                                      |
| "                | c | 20            | 23       | 22                   |                                      |
| "                | d | 10            | 7        | 8                    |                                      |
| IRELAND, N.      | a | 27            | 43       | 35                   | 70                                   |
| "                | b | 37            | 33       | 35                   |                                      |
| "                | c | 20            | 17       | 19                   |                                      |
| "                | d | 16            | 7        | 11                   |                                      |
| IRELAND, S.      | a | 30            | 47       | 39                   | 77                                   |
| "                | b | 33            | 43       | 38                   |                                      |
| "                | c | 37            | 7        | 22                   |                                      |
| "                | d | 0             | 3        | 1                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 40            | 53       | 47                   | 76                                   |
| "                | b | 34            | 25       | 29                   |                                      |
| "                | c | 19            | 14       | 17                   |                                      |
| "                | d | 7             | 8        | 7                    |                                      |

Submitted—The following list of publications which had been received since the last meeting :—

- Tacubaya, Observatorio Astronómico Nacional.*—Anuario. Año xiii. 1892.  
*Azambuja, G. A. de.*—Anuario do Estado do Rio Grande do Sul para o anno de 1893.  
*Jamaica.*—Jamaica rainfall for the year 1890.  
*Wilson, W. E., and Rambaut, A. A.*—The absorption of heat in the solar atmosphere  
*Woeikof, A.*—Klima des Puy de Dome in Centralfrankreich.  
*Colombo, Surveyor General.*—Report on the meteorology of Ceylon for 1891.  
*Calcutta, Meteorological Office.*—Report on the meteorology of India in 1890.  
*Riccò, A.*—Das Observatorium zu Catania und die Station auf dem Aetna.  
 — Taches solaires et perturbations magnétiques en 1892.  
 — Fumo di Vulcano veduto dall' osservatorio di Palermo durante l'eruzione del 1889 ed applicazione della termodinamica alle eruzioni vulcaniche.  
 — Der gegenwärtige Ausbruch des Aetna.  
 — Éruption de l'Etna de 1892.  
 — L'eruzione dell' Etna. (2 papers.)  
 — *e G. Mercalli.*—Sopra il periodo eruttivo dello Stromboli cominciato il 24 Giugno 1891.

63, Victoria Street, January 11, 1893.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.

PROFESSOR DARWIN.

MR. GALTON.

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (December 14) were read and confirmed.

Read—Letter (M.O. 66) from the Science and Art Department relative to a proposed International Conference at Washington, July 26, 1893.—Consideration postponed.

Mr. Scott reported (Minutes, p. 59) that the Chairman had suggested some addition to the draft form of indemnity to the Royal Society, and that he had communicated with Messrs. Few accordingly. A letter from Messrs. Few (No. 42), forwarding an amended draft, was read.

The draft thus amended was approved, and Mr. Scott was instructed to forward it to Messrs. Few. (P.C. 49.)

Read—Letter 2253 from the Admiral Superintendent of Naval Reserves, stating that the sea temperature observations would be continued until December 31, 1895. (Minutes, p. 60.)

Mr. Buchan made application to the Council to have hourly tabulations made of some, at least, of the records of sunshine. Mr. Scott was instructed to obtain from Mr. R. Curtis a report on the amount of work which such a proposal would entail on the Office.

Read—Letter 2083/92 from Mr. Cullum submitting estimates for repairs to, and supply of, gates, and for repairs of fences, &c., on the land at Westwood House, which is used for grazing purposes by the Council, Mr. Cullum himself undertaking to keep in order the parts of the land of which he has the use.

The total amount of Mr. Cullum's estimate was 28*l.* 5*s.* 0*d.*

It was resolved to allow the sum of 20*l.* towards this expenditure.

With reference to the anemometers at Holyhead (Minutes, p. 60), Mr. Scott submitted the following memorandum, prepared at Mr. Galton's request, and he was instructed to request Captain Clapp to make arrangements for keeping the instruments going until the Council had decided as to their maintenance. (P.C. 50.)

#### MEMORANDUM on the BRIDLED ANEMOMETER at HOLYHEAD.

January 10, 1893.

THE bridled anemometer has been at work at Holyhead since September 1880.

In April 1890, as a result of Mr. Dines's experiments, the arrangement of the cups was altered, and instead of the five cups being placed in one plane they were re-arranged spirally on the spindle.

The new arrangement was fitted up, and the instrument was re-started in July 1890. With the exception of this break of three months the anemometer has been at work continuously since it was first started in 1880.

Curves are not obtained for every day; in calm weather the sheets are sometimes omitted for several days, and when working in moderate winds three, or even four, days traces are occasionally got upon the same sheet of paper.

From data supplied by Mr. Dines a scale has been constructed for measuring the curves obtained with the new arrangement of cups; but up to the present no scale has been made for the curves got from the old form of the instrument.

The instrument does not act in light winds, and with the weights ordinarily used, viz., 16 lbs. 14 ozs., a velocity of about 15 miles per hour is required to move the pencil from the zero. Under the same conditions a velocity of 90 miles per hour will carry the pencil to the upper limit of the scale. The weights can, however, be increased, and in very strong gales this is occasionally done. In December 1891 with a load of 24 lbs. 1 oz. upon the "snails" the pencil was taken considerably beyond the top of the scale, while with the smaller load the cups have often made more than a complete turn. The velocities quoted are *actual* velocities obtained by Mr. Dines' whirling apparatus, and are, roughly speaking, only two-thirds of what would be obtained from Robinson's anemometer, using the usual factor 3.

The normal time-scale of the curves is a very open one, but the instrument is provided with an arrangement for doubling it in gales, and for still further enlarging it, under exceptional circumstances, to about 24 times its normal size.

The character of the trace is similar to that of the ordinary pressure-plate anemometer, and every variation of the wind-force is shown; but it is an advantage of the bridled anemometer that the record is not open to the uncertainty which attaches to variation in shape and area of the plate of the pressure instrument.

The traces, especially with the open time-scale, make it possible to study with great facility the *character* of a gale. Not only are the more important gusts and lulls clearly shown, but the frequent oscillations of greater or less magnitude, which constitute what may be called the "body of the gale," with their periodic variations, are also more clearly shown than in the trace of any other instrument with which I am acquainted. Probably the trace from Mr. Dines's tube anemometer will be somewhat similar, but with the smaller time-scale of that instrument it cannot be expected to yield such clear and open results as are got from the bridled anemometer.

The conception one gets of a gale from these curves is entirely unlike that which can be got from the ordinary Robinson cup record, from which it is almost impossible to say whether the characteristic feature of the gale was its squalliness or its steadiness, and quite impossible to say anything as to its maximum force.

No attempt has yet been made to use the curves, but I think that they are capable of yielding valuable information with respect to wind-force which at present cannot be obtained from any other source.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

Read—A memorandum from Mr. Baillie stating that since last meeting 10 logs had been received, five of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Read—Letter (No. 12) from the Shipmasters Society requesting the free supply of the Daily Weather Charts, and a letter (No. 11) from Captain Toynbee supporting the request.—Granted.

With reference to the circular to recipients of the Office publications (Minutes, 1891, p. 51), Mr. Scott reported that the result of the circular had been to reduce the total number of copies distributed by about 22 per cent.—Approved.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

#### 1. WARNINGS ISSUED.

|                    |   |   |   |   |                 |
|--------------------|---|---|---|---|-----------------|
| A + B (successful) | - | - | - | - | = 39 districts. |
| C (failures)       | - | - | - | - | = 22 district.  |

#### 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
January 11, 1892.

*Note.*—The weather of this period has been very difficult to deal with. Repeatedly there have been indications of bad weather too serious to neglect, but the depressions which they appeared to announce have proved to be comparatively unimportant systems.

F. G.

**Submitted—**The following reports on the 8.30 p.m. forecasts for December 1892:—

The letters used have the following signification:—

**a** = complete success.

**b** = partial (i.e. more than half) success.

**c** = partial failure.

**d** = total failure.

DECEMBER.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 39            | 58       | 49                   | 75                                   |
| "                | b | 29            | 23       | 26                   |                                      |
| "                | c | 23            | 10       | 16                   |                                      |
| "                | d | 9             | 9        | 9                    |                                      |
| SCOTLAND, E.     | a | 29            | 55       | 42                   | 71                                   |
| "                | b | 35            | 23       | 29                   |                                      |
| "                | c | 26            | 13       | 20                   |                                      |
| "                | d | 10            | 9        | 9                    |                                      |
| ENGLAND, N.E.    | a | 42            | 58       | 50                   | 73                                   |
| "                | b | 26            | 19       | 23                   |                                      |
| "                | c | 26            | 13       | 19                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| ENGLAND, E.      | a | 42            | 61       | 52                   | 76                                   |
| "                | b | 29            | 20       | 24                   |                                      |
| "                | c | 26            | 16       | 21                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| MIDLAND COUNTIES | a | 39            | 55       | 47                   | 81                                   |
| "                | b | 29            | 29       | 34                   |                                      |
| "                | c | 26            | 3        | 15                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| ENGLAND, S.      | a | 32            | 55       | 44                   | 79                                   |
| "                | b | 39            | 32       | 35                   |                                      |
| "                | c | 29            | 10       | 20                   |                                      |
| "                | d | 0             | 3        | 1                    |                                      |
| SCOTLAND, W.     | a | 23            | 42       | 33                   | 68                                   |
| "                | b | 42            | 29       | 35                   |                                      |
| "                | c | 26            | 19       | 23                   |                                      |
| "                | d | 9             | 10       | 9                    |                                      |
| ENGLAND, N.W.    | a | 23            | 52       | 38                   | 73                                   |
| "                | b | 51            | 19       | 35                   |                                      |
| "                | c | 13            | 23       | 18                   |                                      |
| "                | d | 13            | 6        | 9                    |                                      |
| ENGLAND, S.W.    | a | 26            | 58       | 42                   | 88                                   |
| "                | b | 55            | 32       | 44                   |                                      |
| "                | c | 6             | 10       | 8                    |                                      |
| "                | d | 13            | 0        | 6                    |                                      |
| IRELAND, N.      | a | 29            | 49       | 39                   | 80                                   |
| "                | b | 39            | 42       | 41                   |                                      |
| "                | c | 26            | 3        | 14                   |                                      |
| "                | d | 6             | 6        | 6                    |                                      |
| IRELAND, S.      | a | 19            | 48       | 34                   | 76                                   |
| "                | b | 52            | 32       | 42                   |                                      |
| "                | c | 23            | 10       | 16                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 31            | 51       | 43                   | 76                                   |
| "                | b | 39            | 28       | 33                   |                                      |
| "                | c | 23            | 12       | 18                   |                                      |
| "                | d | 7             | 6        | 6                    |                                      |

Submitted—The following statement of accounts :—

|                                                  | £      | s. | d. |
|--------------------------------------------------|--------|----|----|
| Cash balance on 13th December - -                | 2,923  | 0  | 5  |
| Receipts from 14th December to 10th January -    | 257    | 11 | 6  |
|                                                  | 3,180  | 11 | 11 |
| Cheques drawn from 14th December to 10th January | 1,747  | 5  | 4  |
| Balance on 10th January -                        | £1,433 | 6  | 7  |

Submitted the following :—

#### MEMORANDUM.

The following instruments have been ordered :—

|                                                       | £ | s. | d. |
|-------------------------------------------------------|---|----|----|
| 6 Terrestrial radiation thermometers ; estimated cost | 5 | 11 | 0  |

Permission is requested to order as requisite for stock :—

#### “ A ” Account.

|                                           | £   | s. | d. |
|-------------------------------------------|-----|----|----|
| 300 Thermometers, estimated cost - -      | 105 | 0  | 0  |
| 50 Maximum thermometers, estimated cost - | 65  | 0  | 0  |
| 50 Minimum “ “ “ -                        |     |    |    |
| 25 Barometers, estimated cost - -         | 106 | 0  | 0  |
| 25 Aneroids “ “ “ -                       | 60  | 0  | 0  |
| 25 Thermometer screens, estimated cost -  | 13  | 0  | 0  |

#### “ B.T.” Account.

|                                          |     |   |   |
|------------------------------------------|-----|---|---|
| 300 Thermometers, estimated cost - -     | 105 | 0 | 0 |
| 25 Barometers “ “ -                      | 100 | 0 | 0 |
| 25 Thermometer screens, estimated cost - | 13  | 0 | 0 |
| 6 Rain-gauges, estimated cost -          | 12  | 0 | 0 |
| 2 Stevenson's screens, estimated cost -  | 4   | 4 | 0 |

(Signed)

R. STRACHAN,

January 11, 1893.

To R. H. Scott, Esq., F.R.S.

Read—Letter (No. 2195) from Dr. Miller reporting that Mr. Canham would not be able to resume his usual duty (Minutes, p. 37). It was decided to declare his clerkship vacant, and to grant him a gratuity of 20l.

To the vacancy as fourth-class clerk thus created, Mr. E. J. Hood, who had been in the Office since October 1882, was appointed at a salary commencing at 60l. per annum from January 1, 1893 ; increments to commence April 1894.

Read—Letter (No. 36) from Dr. Bartley stating that Mr. Edward Wall, the Office-keeper, was suffering from cerebral congestion.

It was resolved to grant him three months leave on half pay.

Submitted—The following reports of work during the month of December 1892 :—

#### MARINE BRANCH.

January 10, 1893.

Examined 11 new logs.

Discussing the information relating to winds, currents, &c. in the district between the Cape of Good Hope and New Zealand. Preparing specimen charts, and practising the drawing of wind-roses.

Completing the discussion of the current charts for the Red Sea and Gulf of Aden.

Collecting current observations for the Arctic regions from various sources. Copies of the monthly charts made for Dr. Nansen.

Charting sea temperatures for each month over a portion of the North Atlantic Ocean to the westward of our Islands.

The Marine Superintendent.

(Signed)

CHAS. HARDING.

Forwarded for the information of the Council.

(Signed)

C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.  
(To December 31, 1892.)

*Quarterly Weather Report, 1881 :—*

First quarter, ready for printer.

Second quarter, being written ; one fourth done.

*Weekly Weather Report, 1892 :—*

All numbers issued promptly.

*Appendices I.* (Parts 4 and 5), and *II.* nearly ready for printer.

*Monthly Summaries*—No. 1, for January, only done. Tables, &c. for other months (excepting December) are ready.

*Daily Weather Report, 1892 :—*

All numbers issued promptly.

Monthly correction sheets issued up to, and including, that for November ; that for December and the Title page and Frontispiece are all in hand.

*Primary Checking of Storm Warnings, 1892.*—Done.

*Checking of (8.30 p.m.) Forecasts, 1892.*—Done.

*Checking of Hay Harvest Forecasts, 1892.*—Completed, and Summary almost ready.

*Plotting Selected Rainfall Stations, &c.*—Still in hand (being delayed now by Christmas holidays, sickness, &c.).

C. Pycock has been absent owing to sickness since December 12th.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
January 11, 1893.

PANTAGRAPH ROOM.

January 2, 1893.

*Hourly Means.*—The calculation of the Hourly and other Mean Values required for the tables for 1891 is still in hand, and is about one fourth completed.

The routine work of the room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

January 2, 1893.

*Examinations.*

*September 1892.*—Partly done.

*October and November, 1892.*—Kew and Valencia work completed.

Weekly examination (on receipt) of curves and documents from all observatories.

*Miscellaneous.*

*Diurnal Range of Rainfall, 1871–90.*—Examination and correction of the hourly values, 1887.

Preparing list of glass and ivory scales.

Revising proofs of rain papers.

General routine work, and Mr. Parsons was transferred for temporary service as Office-keeper on the 30th.

(Signed) T. E. ALLEN.

**Submitted**—The following list of publications which had been received since the last meeting :—

*Lloyd's Seaman's Almanac, 1893.*

*Toynbee, H.*—Weather forecasting for the British Islands.

*Clements, H.*—Weather almanack, 1893.

*Russell, Hon. R.*—Observations on dew and frost.

*Washington, Weather Bureau.*—Observations and experiments on the fluctuations in the level and rate of movement of ground-water on the Wisconsin Agricultural Experiment Station Farm and at Whitewater, Wisconsin.

*Mendenhall, T. C.*—Report of studies of atmospheric electricity.

*Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.*—Onweders in Nederland, 1891. Deel xii.

*Russell, W. J.*—A sketch of the chemical history of the air.

*St. Petersburg, Kaiserliche Akademie der Wissenschaften.*—Repertorium für Meteorologie. Bd. xv.

— *Physikalisches Central Observatorium.*—Annalen. Jahrg. 1891. Theil i. und ii.

*Habenicht, H.*—Häufigkeit der Eisberge im Golfstrom und Klimaschwankungen.

*Clayton, H. H., and Fergusson, S. P.*—Measurements of cloud heights and velocities.

*Bombay, Meteorological Office.*—Brief sketch of the meteorology of the Bombay Presidency in 1891–92.

*Jamaica rainfall for the year 1891.*

*Adelaide Observatory*—Rainfall in South Australia and the northern territory during 1891

*Volante, G.*—Osservazioni meteorologiche fatte in Alessandria alla Specola del Seminario nell'anno 1891.

63, Victoria Street, January 25, 1893.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN.  
MR. GALTON.

MR. STONE.  
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 11) were read and confirmed.

Read—Letter 122, from Messrs. Few & Co., enclosing form of Indemnity to the Royal Society to be sealed by the Council (Minutes, p. 63).

Resolved—That the seal of the Association be affixed to the Deed of Indemnity to the Royal Society.

The seal was applied to the Deed in the presence of General R. Strachey (Chairman), Messrs. F. Galton and E. J. Stone, and Mr. R. H. Scott, the Secretary.

The Secretary was instructed to procure a Seal Book, and to enter therein the circumstances of this use of the seal of the Association.

The subjoined letter from the Science and Art Department (Minutes, p. 63) was read :—

(M.O. 66.)

MR. SCOTT,

HAS the Meteorological Council received a similar letter from the Foreign Office? If it has will you please let me know, for the information of my Lords, what answer you propose to give.

If, on the other hand, the Foreign Office has not communicated with your Council, will you please submit this communication to them and ask them to advise my Lords as to what answer should be sent to the Foreign Office.

I should propose, under any circumstances, to send a copy to the Meteorological Society and any other societies interested, so that they might, if they liked, send representatives.

(Signed) J. F. D. DONNELLY.

6th January 1893.

(M.O. 66.)

SIR,

Foreign Office, January 4, 1893.

I AM directed by the Earl of Rosebery to transmit to you, to be laid before the Lords of the Council, copy of a note from the United States Chargé d'Affaires in London inviting Her Majesty's Government to participate in an International Conference of Meteorologists which it is proposed to hold at Washington during the current year, and enclosing copies of the provisional programme.

I am to request that you will move their Lordships to inform his Lordship what answer should be returned to Mr. White's note.

I am, &c.  
(Signed) T. V. LISTER.

The Secretary to the Science and Art.

(M.O. 66.)

MY LORD,

Legation of the United States, London,  
December 30, 1892.

I HAVE the honour, in accordance with the instructions contained in a circular dated 2nd instant which I have received from the Secretary of State, and of which I enclose copies herewith, to acquaint your Lordship that my Government proposes to hold an International Conference of Meteorologists at Washington at a date during the coming year to be hereafter fixed.

I have the honour, furthermore, in behalf of my Government, to invite Her Majesty's Government to participate in the proposed Conference by sending representatives.

I enclose copies of the provisional programme referred to in the circular, and your Lordship will observe that, for reasons set forth in the latter, it is thought advisable that Wednesday, July 26th, 1893, should be fixed upon by general acquiescence for the meeting of the Conference.

It is understood by my Government that a meteorological service, to some extent separate, is maintained in Scotland, Ireland, and in the Colonies of Barbadoes, Bermuda, Canada, Cape Colony, Ceylon, India, Jamaica, Mauritius, Newfoundland, New South Wales, New Zealand, Queensland, South Australia, Tasmania, Trinidad, Victoria, and West Australia; and I am therefore instructed to include members of the Meteorological Services in the United Kingdom and in

the Colonies aforesaid in the invitation, which I have the honour hereby to convey to Her Majesty's Government.

I venture to add that I shall be happy to receive and to communicate promptly to the Secretary of State, in accordance with his instructions, any suggestions which your Lordship may be disposed to make on the subject.

I have, &c.  
(Signed) HENRY WHITE.

Enclosures :

Mr. Foster to Mr. White.—Circular (22 copies) with accompanying provisional programmes.

[Not printed here.]

The Earl of Rosebery, K.G.,  
&c. &c. &c.

Mr. Scott stated that he had ascertained by correspondence that no similar invitation had reached either Austria, France, Germany, or Norway.

It was resolved to send the following reply :—

IN reply to your inquiry as to the answer that should be given to the invitation of the United States Government to meteorologists to attend an International Conference to be held at Washington in the coming year I am directed by the Meteorological Council to inform you that they are of opinion that the usual periodical meetings of the heads of the chief Meteorological Institutions, of which one was held at Munich in 1891, suffice for the useful interchange of views on scientific questions, and the best means of co-operation among various countries, and they regret that it will not be in their power to send a representative to the proposed Conference at Washington.

(Signed) ROBERT H. SCOTT,  
Secretary.

Meteorological Office,  
January 26, 1893.

Read—The following letter :—

(M.O. 118.)

SOUTH KENSINGTON MUSEUM.

Department of Science and Art, London, S.W.,  
January 14, 1893:

SIR,

I AM directed to inform you that it has been determined by the Lords of the Committee of Council on Education to give greater prominence than heretofore in the Science Collections now shown in the Western Galleries of the South Kensington Museum, to the illustration of apparatus connected with meteorology.

A list of the more important instruments as yet unrepresented there has been prepared for this Department by Mr. G. J. Symons. It is believed that owners and makers of many of these will be willing to contribute examples on loan for exhibition.

In this list are included the instruments named on the other side belonging to or made by your Council.

I am to express their Lordships hope that you will be so good as to lend examples of these, to be added to the collection already on view.

Each instrument will be labelled, the name of the lender being stated, together with the selling price, in case examples may be purchased.

I am, &c.  
(Signed) A. J. R. TRENDALL.

The Secretary,  
Meteorological Council,  
Victoria Street, S.W.

A list accompanied the letter, copied from the catalogues of the various exhibitions conducted of late years by the Royal Meteorological Society.

Mr. Scott was instructed to prepare a report on the extent to which the application could be complied with.

Read—Letter 109 from Captain Clapp stating that he would make arrangements for carrying on the two anemometers at Holyhead for the present (Minutes, p. 64).

And also a further memorandum (Letter 109) from Mr. R. Curtis (dated January 23) on the desirability of maintaining the bridled anemometer in action at some well-exposed station.

Mr. Scott was instructed to consult with Captain Clapp as to the possibility of making future permanent arrangements at Holyhead (P.C. 162).

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

1. WARNINGS ISSUED.

A + B (successful) - - - = 27 districts.  
C (failures) - - - = 6 districts.

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
January 25, 1893.

Submitted—The following :—

HAY HARVEST FORECASTS, 1892.

Meteorological Office, Telegraph Branch,  
January 26, 1893.

SIR,

I BEG to submit, herewith, the results of the checking of the Hay Harvest Forecasts issued during the hay-making period of 1892.

The telegrams were sent daily between 3.30 p.m. and 4 p.m. on each week-day for about five weeks. The issue commenced over the Southern districts of England on the 13th June, and ended 16th July; but commenced and ended about a fortnight later in the more Western and Northern parts of the country.

Notwithstanding the very unsettled conditions which again prevailed during the summer months, the general per-centage of success reached 88. The largest general per-centage (96) was reached in England, N.W., while the smallest (78) was in Scotland, E.

In Table II. will be found the names and addresses of the various recipients; but, in addition to these, telegrams were sent to six other gentlemen at their own cost. In this Table also will be found remarks made by those who received the information, speaking very favourably of the forecasts.

I am, &c.

R. H. Scott, Esq., M.A., F.R.S.,  
Secretary, Meteorological Council.

(Signed) FREDC. GASTER.

HAY HARVEST FORECASTS, 1892.

TABLE I.—SUMMARY of RESULTS.

| Districts.       | Names of Stations.                        | Per-centages.     |                  |                  |                | Total Per-centage of Success. |
|------------------|-------------------------------------------|-------------------|------------------|------------------|----------------|-------------------------------|
|                  |                                           | Complete Success. | Partial Success. | Partial Failure. | Total Failure. |                               |
| SCOTLAND, N. -   | Munlochy and Golspie -                    | 61                | 28               | 11               | —              | 89                            |
| SCOTLAND, E. -   | Aberfeldy, Rothiemay, and Glamis          | 58                | 20               | 16               | 6              | 78                            |
| ENGLAND, N.E.    | Ulceby and Chatton -                      | 46                | 35               | 14               | 5              | 81                            |
| ENGLAND, E. -    | Thorpe and Rothamsted -                   | 50                | 32               | 15               | 3              | 82                            |
| MIDLAND COUNTIES | Cirencester and Retford -                 | 44                | 38               | 15               | 3              | 82                            |
| ENGLAND, S. -    | Reading, Maidstone, Horsham, and Downton. | 61                | 30               | 8                | 1              | 91                            |
| SCOTLAND, W.     | Ardwell, Dumbarton, and Islay -           | 63                | 29               | 5                | 3              | 92                            |
| ENGLAND, N.W.    | Leyburn and Prescot -                     | 61                | 35               | 4                | —              | 96                            |
| ENGLAND, S.W.    | Clifton, Glastonbury, and Falfield.       | 60                | 33               | 7                | —              | 93                            |
| IRELAND, N. -    | Edgeworthstown and Moynalty -             | 58                | 30               | 9                | 3              | 88                            |
| IRELAND, S. -    | Ardfert, Kilkenny, and Parsons-town.      | 56                | 38               | 6                | —              | 94                            |
|                  | Mean for all districts -                  | 56                | 32               | 10               | 2              | 88                            |

## HAY HARVEST FORECASTS, 1892.

TABLE II.—RETURN showing the NUMBER of FORECASTS sent to each of the under-mentioned PERSONS, with the SUCCESS or otherwise of the FORECASTS.

| Districts.          | To whom sent.                                                                                                 | Addresses.                                                                                                                                                             | No. of<br>Forecasts<br>sent. | No. of<br>Forecasts<br>checked. | Per-centages.                        |                                      |                                  | Remarks.                  |
|---------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|--------------------------------------|--------------------------------------|----------------------------------|---------------------------|
|                     |                                                                                                               |                                                                                                                                                                        |                              |                                 | Complete<br>Success.                 | Partial<br>Success.                  | Total<br>Failure.                |                           |
| 0. SCOTLAND, N.     | Major Smith<br>Rev. Dr. Joass                                                                                 | Munlochy, Inverness<br>Golspie                                                                                                                                         | 38<br>38                     | 38<br>36                        | 57·9<br>63·9                         | 34·1<br>22·2                         | 8·0<br>13·9                      | —<br>—                    |
| 1. SCOTLAND, E.     | C. W. L. Forbes<br>G. Murdoch<br>J. Whitton                                                                   | Aberfeldy<br>Rothiemay, Huntley<br>Glamis Castle, Glamis                                                                                                               | 30<br>30<br>24               | 30<br>30<br>24                  | 63·3<br>53·3<br>58·3                 | 13·3<br>26·7<br>20·8                 | 6·7<br>13·3<br>16·7              | 6·7<br>6·7<br>4·2         |
| 2. ENGLAND, N.E.    | J. Turner<br>Sir Jacob Wilson                                                                                 | The Grange, Ulceby<br>Chillingham Barns, Chilton,<br>Northumberland.                                                                                                   | 30<br>83                     | 30<br>80                        | 46·6<br>46·3                         | 36·7<br>32·5                         | 10·0<br>18·7                     | 6·7<br>2·5                |
| 3. ENGLAND, E.      | W. Birkbeck<br>Sir J. B. Lawes, Bart.<br>Professor Hugo Ohm                                                   | High House, Thorpe, Norwich<br>Rothamsted, St. Albans<br>Royal Agricultural College,<br>Cirencester.                                                                   | 30<br>30<br>30               | 30<br>30<br>30                  | 53·3<br>46·7<br>43·3                 | 23·4<br>40·0<br>36·7                 | 20·0<br>10·0<br>20·0             | 3·3<br>3·3<br>—           |
| 4. MIDLAND COUNTIES | E. E. Harcourt-Vernon<br>Martin J. Sutton                                                                     | The Grove, Retford<br>Kidmore Grange, Caversham,<br>Oxford.                                                                                                            | 30<br>30                     | 30<br>30                        | 46·6<br>53·3                         | 36·7<br>36·7                         | 10·0<br>10·0                     | 6·7<br>—                  |
| 5. ENGLAND, S.      | C. Whitehead<br>The Aylesbury Dairy<br>Company, Limited.<br>E. P. Squarey<br>M. J. Stewart, M.P.<br>W. Calder | Barning House, Maidstone<br>The Aylesbury Dairy Company,<br>Limited, Horsham.<br>The Moot, Downton, Wilts<br>Ardwell, Wigtownshire<br>Castle Hill, Dalreock, Dumbarton | 30<br>42<br>30<br>30<br>30   | 30<br>36<br>30<br>29<br>30      | 60·0<br>58·3<br>73·3<br>56·7<br>65·5 | 36·7<br>27·8<br>20·0<br>40·0<br>24·1 | 3·3<br>11·1<br>6·7<br>3·3<br>6·9 | —<br>2·8<br>—<br>—<br>3·5 |
| 6. SCOTLAND, W.     | J. S. R. Ballingal<br>G. W. Wray<br>The Earl of Derby,<br>K.G.                                                | Eallabus, Islay<br>Leyburn, R.S.O., Yorks<br>Knowsley, Prescott                                                                                                        | 36<br>36                     | 36<br>30                        | 66·7<br>66·7                         | 36·1<br>33·3                         | 8·4<br>—                         | 6·7<br>—                  |
| 7. ENGLAND, N.W.    | T. Dyke<br>R. Neville Grenville<br>The Earl of Ducie                                                          | Long Ashton, Clifton, Bristol<br>Butleigh Court, Glastonbury<br>Tortworth, Gloucestershire                                                                             | 30<br>36<br>30               | 30<br>30<br>30                  | 53·3<br>66·7<br>60·0                 | 40·0<br>30·0<br>30·0                 | 6·7<br>3·3<br>10·0               | —<br>—<br>—               |
| 8. ENGLAND, S.W.    | J. M. Wilson, J.P.<br>E. F. Farrell<br>W. Talbot Crosbie, D.L.                                                | Currygrane, Edgeworthstown<br>Moynalty, Kells, Co. Meath<br>Ardfert Abbey, Tralee                                                                                      | 29<br>42<br>30               | 29<br>36<br>30                  | 55·2<br>61·1<br>53·3                 | 31·0<br>27·8<br>43·4                 | 10·3<br>8·3<br>3·3               | 3·5<br>2·8<br>—           |
| 9. IRELAND, N.      | Dawson A. Milward<br>The Earl of Rosse,<br>K.P.                                                               | Lavistown, Kilkenny<br>Parsonstown                                                                                                                                     | 30<br>29                     | 30<br>29                        | 66·7<br>48·3                         | 23·3<br>48·3                         | 10·0<br>3·4                      | —<br>—                    |
| 10. IRELAND, S.     |                                                                                                               |                                                                                                                                                                        |                              |                                 |                                      |                                      |                                  |                           |

Mr. Whitehead says: "The reports have  
"been more correct than in any pre-  
"vious season."

Mr. Farrell remarks: "The forecasts  
"have been most useful this year, as  
"they have been practically correct."

\* Some expenses under this head not yet brought to account.

Read—The following letter :—

(M.O. 151.)

Royal Meteorological Society,  
22, Great George Street, Westminster, S.W.,  
January 20, 1893.

SIR,

I AM directed to forward to you, for the information of the Meteorological Council, a copy of the Report of the Wind Force Committee, which was adopted by the Council of this Society at their meeting on the 18th instant.

I am, &c.

(Signed) FRANCIS CAMPBELL BAYARD,  
Secretary.

Robert H. Scott, Esq., F.R.S.,  
Meteorological Office.

#### COPY of REPORT.

THE Committee are of opinion that the results of Mr. Dines's experiments have confirmed the evidence that the use of the factor 3 for the Robinson anemometer known as the Kew pattern—the dimensions of which are: distance of the centre of cups from centre of axle, 24 inches; and the diameter of the cups, 9 inches—is incorrect, and recommend the adoption of the factor 2·1 for that pattern.

As regards the small-sized cup anemometers, sometimes called Robinson's anemometers, the Committee find that they have been constructed of such various sizes and proportions that no general factor can be assigned. The factor is probably higher than that for the Kew pattern, but may be anything between 2·1 and 3·0; nothing but the verification of each individual instrument can enable its factor to be determined.

(Signed) FRANCIS CAMPBELL BAYARD  
Secretary.

Submitted—Letter 90 from Lloyd's, offering to supply telegraphic reports from Cape Spartel, in Morocco, if the Council would lend the necessary instruments. Mr. Scott stated that he had replied (P.C. 63) that telegraphic reports from Cape Spartel were not required, but that monthly records of observations would be of considerable value. He submitted a further letter (No. 125) from Lloyd's requesting the supply of instruments for the purpose of forwarding monthly returns.

The supply was granted (P.C. 164).

Read—A memorandum from Mr. Baillie stating that since last meeting one log had been received, which was "excellent." Mr. Scott was instructed to convey the best thanks of the Council for it.

Reported—That the cash accounts for the six months ended the 30th September 1892 had been audited on the 19th instant by Mr. Galton and Professor Darwin, and would be sent in due course to the Treasury for the Audit Office. The receipts for the six months amounted to 7,491*l.* 9*s.* 8*d.*, the payments amounted to 7,591*l.* 16*s.* 7*d.*, leaving a balance of 1,603*l.* 0*s.* 11*d.* in hand and at the bank on the 1st October 1892, as against 1,703*l.* 7*s.* 10*d.* on the 1st April last.

Submitted—The following statement of accounts :—

|                                               | £     | s. | d. |
|-----------------------------------------------|-------|----|----|
| Cash balance on 10th January - - -            | 1,433 | 6  | 7  |
| Receipts from 11th to 24th January - - -      | 4,819 | 3  | 7  |
|                                               | 6,252 | 10 | 2  |
| Cheques drawn from 11th to 24th January - - - | 172   | 12 | 8  |
| Balance on 24th January - - - - -             | 6,079 | 17 | 6  |

Submitted—The following list of publications which had been received since the last meeting :—

*Stuttgart, Königl. statistisches Landesamt.*—Mitteilungen. iv. Jahrg. 1892. Nos. 1–12.

*Zürich, Schweizerische Meteorologische Central-Anstalt.*—Annalen. 1890.

*Utrecht, K. Nederlandsch Meteorologisch Instituut.*—Onweders in Nederland. 1890. Deel xi.

*Dickson, H. N.*—The physical conditions of the waters of the English Channel.

*Rotch, A. L.*—The mountain meteorological stations of the United States.

— New high level meteorological observations in France.

— Mountain meteorology.

*Ellis, W.*—Map showing lines of equal magnetic declination for January 1, 1893.

*Turin, Osservatorio della R. Università.*—Osservazioni meteorologiche. 1891.

*Paris, Service Hydrométrique du Bassin de la Seine.*—Observations sur les cours d'eau et la pluie centralisées pendant l'année 1891.

— — — — — Résumé des observations centralisées pendant l'année 1891.

*Zürich, Schweiz. Departement des Innern.*—Graphische Darstellung der schweizerischen hydro-metrischen Beobachtungen. 1892.

— — — — — Tabellarische Zusammenstellung der Haupt-Ergebnisse für das Jahre 1889.

*Genoa, Osservatorio Meteorologico della Regia Università.*—Stato meteorologico e magnetico di Genova. 1889-1891. Anni lvii.-lix.

*London, General Register Office.*—Annual report of the Registrar General of Births, Deaths, and Marriages in England. 1891.

*Habernicht, H.*—Trockenperioden, Influenza und Cholera.

63, Victoria Street, February 9, 1893.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.  
MR. GALTON.

MR. STONE.  
THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 25) were read and confirmed.

The Secretary produced the seal fitted with a bar and two padlocks with duplicate keys. It was resolved that one key be in the custody of the Chairman, the other in that of the Secretary, and that the duplicate keys of each padlock be entrusted, for safe custody, to the Royal Society.

Mr. Scott submitted a report on the apparatus for which the authorities at South Kensington Museum had made application (Minutes, p. 69). It appeared that almost all the instruments named were specimens of instruments used at foreign meteorological stations.

It was resolved to offer to lend for exhibition such instruments only as were at present in the Office in duplicate; of these there were five out of a total number of 24 applied for (P.C. 282).

Read—Letter 233 from the Weather Bureau, Washington, stating that it was proposed to hold an International Conference at Washington in July, and hoping that the Council would be disposed to support the project.

Mr. Scott was instructed to forward to Professor Harrington a copy of the reply sent by the Council to the Science and Art Department (Minutes, p. 69).

Read—Letter 69 from Professor Mascart, stating his reasons for not applying a correction for the gravity of lat. 45° to the French barometer readings (Minutes, p. 50), and a memorandum from Mr. Gaster asking if he was to take off the corrections applied since January 1, 1893, to all barometer readings from countries lying east of France, viz., Austria, Germany, Russia, and the Scandinavian kingdoms.

It was resolved that the readings be inserted in the weather maps of the Office as received by wire.

Read—Letter 204 from Sir G. G. Stokes, in reply to P.C. 126 from Mr. Scott, recommending that the factor 3 be still used for reducing the values from the Kew pattern Robinson anemometer, but that it should be stated at the head of the tables that that factor had been employed.—Approved; reply to be sent to the Royal Meteorological Society accordingly (P.C. 281).

Read—Letter P.C. 162 to Captain Clapp in regard of the future arrangements for anemometers at Holyhead, and his reply (Letter 234), in which he said that Mr. Cotton, C.E., would be ready to undertake the charge of both anemometers for the allowance of 20*l.* per annum, being the same as that heretofore made to Mr. Hugh Williams.

Mr. Scott was instructed to make arrangements on the basis proposed by Captain Clapp, and to report further on the subject. It was resolved that "slow motion," the cylinder running down in 24 hours, be no longer used on the bridled anemometer, as not supplying information of sufficient value.

Read—Letter 267 from Messrs. Few, enclosing their bill of costs for the purchase of Westwood House, amounting in all to 78*l.* 10*s.* 1*d.* Mr. Scott was instructed to propose to pay a sum of 60*l.* in full discharge of all claims on this account (P.C. 272).

Mr. Scott reported that in the month of May last he had applied to the Deutsche Seewarte at Hamburg for copies of their current observations, especially from the Pacific Ocean. Dr. Neumayer had replied (Letter 1869/92) that the cost of extraction would be about 20*l.*, and he was authorised (P.C. 1964) to expend that sum. Letters were now read from Dr. Neumayer (Nos. 197 and 276) stating that the amount of material in his office was larger than he had imagined it to be, and asking if the Office would sanction the expenditure of a further sum of 10*l.*—Sanctioned (P.C. 263).

Read—The following Report (Minutes, p. 57) :—

I BEG to submit herewith three maps showing (1) for England and Wales, (2) for Scotland, (3) for Ireland, the stations for which it is proposed that the Council should publish monthly and annual values for the rainfall in the 10 years 1881–90; also a list of the English and Welsh stations, arranged in counties and districts, giving for each its altitude above the mean sea level, and its mean annual rainfall in the decade referred to. (The lists for Scotland and Ireland are not quite ready.)

The stations shown have been selected so as to indicate, as nearly as may be, the general distribution of rainfall over the kingdom, but the choice has been regulated by instructions from the Council in order to avoid overcrowding.

It is believed, however, that in nearly all counties those stations which show the maximum and the minimum falls and those representing high-level and low-level districts respectively are fairly represented; and in the neighbourhood of large cities or towns there are more stations than in the open country.

It should be mentioned that, while in Scotland and Ireland nearly all the stations for which such information is available have been plotted on the maps, the stations available for England are so numerous that only a small portion of these could be utilised. Inquiries, therefore, as to local peculiarities could in many cases be prosecuted if desired with much greater success from the values available than from those proposed in the above-named maps and tables.

(Signed) FREDC. GASTER.

R. H. Scott, Esq.

It was resolved, on Mr. Buchan's suggestion, that the stations should be marked on contour maps, and he was requested to undertake the work.

Read—A memorandum (Letter 288) from Mr. R. Curtis (Minutes, p. 63), stating that the time required for the hourly tabulation of sunshine records would be from 1½ to 2 days per station per year, and that the number of stations available was 7 observatories, 12 stations of the Second Order, and 11 other stations.

It was resolved that the records from the seven observatories be tabulated from January 1st, 1881.

Read—A memorandum from Mr. Baillie, stating that since last meeting eight logs had been received, seven of them being "excellent."

Mr. Scott was instructed to present the charts O. 90 to Captain James Barclay, S.S. "Thermopylæ," and to convey the best thanks of the Council to the other observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

#### 1. WARNINGS ISSUED.

##### SUMMARY.

|                    |   |   |   |                  |
|--------------------|---|---|---|------------------|
| A + B (successful) | - | - | - | = 36 districts.  |
| C (failures)       | - | - | - | = ' 6 districts. |

#### 2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
February 8, 1893.

Submitted—The following reports of work during the month of January 1893:—

MARINE BRANCH.

February 7, 1893.

Examined 8 new logs and 1 lighthouse register.

Discussing the data relating to the district between the Cape of Good Hope and New Zealand, and preparing charts showing—

(1.) Winds, isobars, and air isotherms; and

(2.) Currents, sea isotherms, ice, and whales. A key chart drawn and forwarded to the lithographer.

The two sets of monthly charts, showing the results for the Red Sea district, have been placed in the hands of the lithographer.

For the current charts nearly 4,000 observations in the Pacific Ocean have been received from the Deutsche Seewarte, Hamburg

Preparing charts showing the sea temperature in each month of several years for a part of the Atlantic to the westward of our Islands.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.  
(To 31st January 1893.)

*Quarterly Weather Report*, 1881.—Second quarter: one half done.

*Weekly Weather Report*, 1892.—Appendices I. and II. completed, printed, and issued. Monthly Summaries—no further advance.

*Daily Weather Report*, 1892.—All correction sheets issued, also Frontispiece and Title-page. Volume now ready for binding.

*Weekly Weather Report*, 1893.—All numbers issued promptly to date.

*Primary Checking Storm Warnings*, 1893.—Done to date.

*Checking 8h. 30m. p.m. Forecasts*.—Done to date.

*Checking of Hay Harvest Forecasts*, 1892.—Completed, and results handed in.

*Plotting Selected Rainfall Stations*, 1881–90.—All but done. Preparation of lists for same in progress.

C. Pycock returned to duty 9th January 1893, after absence, owing to illness from 12th December 1892.

(Signed) FREDC. GASTER

Telegraphic Branch,  
February 1, 1893.

PANTAGRAPH ROOM.

February 1, 1893.

*Hourly Means.*

The preparation of the tables for the year 1891 is still in hand. The volume for 1890 is passing through the press, and a portion of the tables has been revised during the month.

The means of pressure and temperature required for the tables published in the Annual Report of the Kew Observatory for 1892 have been commenced, and will be ready in a few days.

The Bunhill Row sunshine records for the latter six months of last year have been tabulated for the Royal Meteorological Society.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

February 1, 1893.

*Examinations.*

*September* 1892.—Nearly completed.

*December* 1892.—Kew and Valencia work completed.

Weekly examination (on receipt) of curves and documents from all observatories.

*Reports.*

*July* 1892.—Copies of "Notes of Errors" to all observatories.

*August–December* 1892.—Copies of "Notes of Errors" to Kew and Valencia.

*Miscellaneous.*

Experiments *re* cause of deterioration of the surface composition of the rain curves. (Results reported), and *re* Report from Kew (M.O. 194, 1893).

*Diurnal Range of Rainfall*, 1871–1890.—Examination and correction of the Hourly Values.

Revising Form No. 29 (anemograph note sheet) and preparing Form 29a (rain note sheet).

General routine work. Mr. Parsons has been absent from branch throughout the month, acting as Office-keeper.

(Signed) T. E. ALLEN.

**Submitted**—The following report on the 8.30 p.m. forecasts for January 1893 :—

The letters used have the following signification :—

**a**=complete success.

**b**=partial (i.e., more than half) success.

**c**=partial failure.

**d**=total failure.

JANUARY.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 36            | 57       | 47                   | 74                                   |
| "                | b | 35            | 20       | 27                   |                                      |
| "                | c | 23            | 13       | 18                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| SCOTLAND, E.     | a | 26            | 67       | 47                   | 78                                   |
| "                | b | 39            | 23       | 31                   |                                      |
| "                | c | 32            | 3        | 17                   |                                      |
| "                | d | 3             | 7        | 5                    |                                      |
| ENGLAND, N.E.    | a | 29            | 42       | 36                   | 78                                   |
| "                | b | 49            | 36       | 42                   |                                      |
| "                | c | 19            | 16       | 18                   |                                      |
| "                | d | 3             | 6        | 4                    |                                      |
| ENGLAND, E.      | a | 23            | 42       | 33                   | 81                                   |
| "                | b | 48            | 49       | 48                   |                                      |
| "                | c | 23            | 6        | 15                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| MIDLAND COUNTIES | a | 23            | 39       | 31                   | 71                                   |
| "                | b | 35            | 45       | 40                   |                                      |
| "                | c | 39            | 13       | 26                   |                                      |
| "                | d | 3             | 3        | 3                    |                                      |
| ENGLAND, S.      | a | 42            | 39       | 41                   | 83                                   |
| "                | b | 39            | 45       | 42                   |                                      |
| "                | c | 13            | 13       | 13                   |                                      |
| "                | d | 6             | 3        | 4                    |                                      |
| SCOTLAND, W.     | a | 23            | 26       | 25                   | 72                                   |
| "                | b | 42            | 52       | 47                   |                                      |
| "                | c | 29            | 13       | 21                   |                                      |
| "                | d | 6             | 9        | 7                    |                                      |
| ENGLAND, N.W.    | a | 32            | 32       | 32                   | 75                                   |
| "                | b | 36            | 49       | 43                   |                                      |
| "                | c | 32            | 3        | 17                   |                                      |
| "                | d | 0             | 16       | 8                    |                                      |
| ENGLAND, S.W.    | a | 29            | 58       | 44                   | 83                                   |
| "                | b | 49            | 29       | 39                   |                                      |
| "                | c | 16            | 0        | 8                    |                                      |
| "                | d | 6             | 13       | 9                    |                                      |
| IRELAND, N.      | a | 20            | 49       | 35                   | 80                                   |
| "                | b | 55            | 35       | 45                   |                                      |
| "                | c | 19            | 6        | 12                   |                                      |
| "                | d | 6             | 10       | 8                    |                                      |
| IRELAND, S.      | a | 22            | 45       | 34                   | 74                                   |
| "                | b | 39            | 42       | 40                   |                                      |
| "                | c | 26            | 3        | 15                   |                                      |
| "                | d | 13            | 10       | 11                   |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 28            | 45       | 37                   | 77                                   |
| "                | b | 42            | 39       | 40                   |                                      |
| "                | c | 25            | 8        | 17                   |                                      |
| "                | d | 5             | 8        | 6                    |                                      |

Submitted—The following statement of accounts :—

|                                                   | £     | s. | d. |
|---------------------------------------------------|-------|----|----|
| Cash balance on 24th January - - -                | 6,079 | 17 | 6  |
| Receipts from 25th January to 7th February -      | 22    | 12 | 2  |
|                                                   | 6,102 | 9  | 8  |
| Cheques drawn from 25th January to 7th February - | 981   | 10 | 5  |
| Balance on 7th February - - -                     | 5,120 | 19 | 3  |

Submitted—The following list of publications which had been received since the last meeting :—

*Manchester Literary and Philosophical Society.*—Memoirs and proceedings. Vol. vi.

*London, Meteorological Office.*—Meteorological observations at Stations of the Second Order for the year 1888.

— Report of the International Meteorological Conference at Munich, August 26th—September 2nd, 1891.

*Hazen, H. A.*—The production of rain.

*Bezold, W. V.*—Der Wärmeaustausch an der Erdoberfläche und in der Atmosphäre.

*Whipple, G. M.*—On the rate at which barometric changes traverse the British Isles.

— Composite portraiture adapted to the reduction of meteorological and other similar observations.

— Results of a comparison of Richard's anémo-cinémographe with the standard Beckley anemograph at the Kew Observatory.

*Elster, J., und Geitel, H.*—Elmsfeuerbeobachtungen auf dem Sonnblick.

*Heinrichs, A.*—Snö- och isförhållandena i Finland år 1890.

*Sundell, A. F.*—Åskvädren i Finland. 1889. 1891.

*Helsingfors, Finska Vetenskaps-Societeten.*—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. xxxiv., 1891-92.

*Calcutta, Meteorological Office, Bengal.*—Meteorological summary for the monsoon period of 1892.

*Wild, H.*—Die Normalbarometer des physikalischen Central-Observatoriums zu St. Petersburg.

*Calcutta, Meteorological Office, India.*—Report on the administration of the Meteorological Department of the Government of India in 1891-92.

*Schück, A.*—Magnetische Beobachtungen auf der Nordsee angestellt in den Jahren 1884 bis 1886, 1890 und 1891.

*Denza, F.*—Gli strumenti registratori della Specola Vaticana e lo scoppio della polveriera del 23 Aprile 1891.

— Pioggia di sabbia.

*Glyde, E. E.*—Abstract of meteorological observations made at Kirkham, Babbacombe, Torquay, during 1892.

— Tenth report (2nd series) of the Committee on the climate of Devon.

*Madrid, Observatorio.*—Observaciones meteorológicas efectuadas en el Observatorio de Madrid durante los años 1890 y 1891.

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63, Victoria Street, February 22, 1893.

PRESENT :

MR. GALTON IN THE CHAIR.

PROFESSOR DARWIN.

MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 8) were read and confirmed.

The subject of the next work to be undertaken by the Marine Branch, after the completion of the extraction of data for the South Indian Ocean (authorised Minutes 1889, pp. 73 and 85), was taken into consideration.

On the suggestion of Mr. Baillie, approved by the Hydrographer, it was resolved that the next district to be discussed should be that of the South Atlantic and South American coast, extending in longitude from 90° W. to 20° E., and in latitude from the Equator as far south as observations are available.

The inquiry to be carried out on the lines authorised, Minutes 1889, p. 85.

Read—Letter No. 297 from Messrs. Few, accepting the proposal of the Council to pay 60% in discharge of their account for expenses connected with the purchase of Westwood House (Minutes, p. 75).

Submitted—Memoranda from Mr. Strachan showing for the last five years the state of stock of instruments in the Office, on both the “Admiralty” and “Board of Trade” accounts.

The Council authorised the order of instruments during the current year, as set out in the list (Minutes, p. 66), to complete stock.

Read—A memorandum from Mr. Baillie stating that since last meeting seven logs had been received, five of them being “excellent.” Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

(1.) WARNINGS ISSUED.

|                    |   |   |   |   |   |               |
|--------------------|---|---|---|---|---|---------------|
| A + B (successful) | - | - | - | - | = | 45 districts. |
| C (failures)       | - | - | - | - | = | 16 districts. |

(2.) GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

A severe gale from the South-east—in Scotland, North-east, on February 14th. At 6 p.m. on the 13th a shallow depression was lying off the north of Ireland, but in the course of the following night a deeper disturbance advanced rapidly from the south-westward, and occasioned steep gradients over the entire kingdom. Our western and southern coasts were duly warned.

(Signed) FREDK. J. BRODIE,  
pro  
FREDC. GASTER.

Telegraphic Branch,  
22nd February 1893.

Submitted—The following statement of accounts:—

|                                         | £ | s. | d.         |
|-----------------------------------------|---|----|------------|
| Cash balance on 7th February            | - | -  | 5,120 19 3 |
| Receipts from 8th to 21st February      | - | -  | 29 2 2     |
|                                         |   |    | <hr/>      |
| Cheques drawn from 8th to 21st February | - | -  | 5,150 1 5  |
|                                         |   |    | <hr/>      |
| Balance on 21st February                | - | -  | 185 6 0    |
|                                         |   |    | <hr/>      |
|                                         |   |    | <hr/>      |
|                                         |   |    | 4,964 15 5 |
|                                         |   |    | <hr/>      |
|                                         |   |    | <hr/>      |

Submitted—The following list of publications which had been received since the last meeting:—

*Hamburg, Deutsche Seewarte.*—Vierteljahrs-Wetter-Rundschau an der Hand der täglichen synoptischen Wetterkarten für den Nordatlantischen Ocean. Band iv.

*Copenhagen und Hamburg, Dänisches meteorologisches Institut und Deutsche Seewarte.*—Tägliche synoptische Wetterkarten für den Nordatlantischen Ocean und die anliegenden Theile der Kontinente. vii. Jahrg. 1–4 Quart., Dez. 1887—Nov. 1888.

*Vienna, K. Akademie der Wissenschaften.*—Berichte der Commission für Erforschung des östlichen Mittelmeeres. Erste Reihe.

*Hamburg, Deutsche Seewarte.*—Deutsche ueberseeische meteorologische Beobachtungen. Heft. v.

*Vienna, Kais. Königl. Geographische Gesellschaft.*—Mittheilungen. 1892.

*Wild, H.*—Ueber die Darstellung des täglichen Ganges der Lufttemperatur durch die Bessel'sche Interpolations-formel.

*Monaco, Prince Albert I<sup>er</sup> de.*—Projet d'observatoires météorologiques sur l'Océan Atlantique.

*Stonyhurst College Observatory.*—Results of meteorological, magnetical, and solar observations. 1892.

63, *Victoria Street*, March 8, 1893.

PRESENT :

MR. GALTON IN THE CHAIR.

MR. BUCHAN.

MR. STONE.

PROFESSOR DARWIN.

The Secretary was in attendance.

The Minutes of the last meeting (February 22) were read and confirmed.

Reported—That on the 4th instant an inquiry (Letter 473) had been received from the Treasury as to a question to be asked in the House of Commons relative to the supply of daily forecasts to 105 lifeboat stations, and that a reply had been sent (P.C. 469) enclosing extracts from the Council Minutes on the subject (pp. 61 and 63, 1891).—Approved.

Submitted—Letter 467 from the Foreign Office, communicating a report of the occurrence of “glazed frost” at Hong Kong in January 1893.

Read—Letter 336 from Professor Wild, being a circular in reply to that of Professor Mascart (Minutes, p. 74), and urging the general introduction of the reduction of all barometer readings to the gravity of 45°.

The Council decided to abide by their former decisions as to the non-application of this correction to the actual readings. The barometrical readings are to be printed in the various publications without the gravity correction. The mean gravity correction for each station to be printed at the head of the table. Specimens to be submitted in proof.

Mr. Buchan submitted the following report on the proposed rain tables (Minutes, p. 75):—

#### SUPPLEMENTARY REPORT on the PROPOSED RAIN STATIONS.

As had been arranged at the Council meeting of February 8th, contour maps of England, Scotland, and Ireland were procured. On these maps the stations recommended in Mr. Gaster's lists were marked in their positions. These were shown at the meeting of Council on March 8th, and on the following day Mr. Gaster and I revised the lists, and added a few other stations with the view of securing a better representation of districts. This revised list is now recommended as the stations for which the ten years (1881–90) observations will be printed.

For these stations monthly amounts will be printed together with means for five-year periods, and it is recommended that, as regards those of the stations for which the amounts were published in the first rainfall publication, the means of each of the five lustra 1866–70, &c. be incorporated in the new publication, together with the 25 years' general means.

There still remains a class of stations which appear for the first time in the new publication, but for which observations are available not only for the ten years ending 1890, but also for the whole of the 25 years ending 1890. It is recommended that the monthly amounts for these stations for each of the 25 years be now printed with lustral and general means.

At this stage it is desirable to ascertain from the Office the cost of collecting the materials for the publication, which may now be done on the assumption that the stations enumerated in Mr. Gaster's English, Scottish, and Irish lists be accepted.

Hereafter it may be considered whether the returns for long series of years may be now proceeded with, or reserved to a future occasion.

(Signed) ALEXANDER BUCHAN.

March 15, 1893.

Mr. Scott was instructed to prepare an estimate of the probable cost of the work.

Read—Letter 434 from Mr. Cotton, C.E., of Holyhead, stating that he had already made alterations in the bridled anemometer, so as to carry out the views of the Council (Minutes, p. 74).

Mr. Scott was instructed to learn from Mr. Cotton the precise character of the alterations made (P.C. 503).

Reported—That Mr. Dines's anemometer had been erected on the roof of the Office, and was being got into operation (Minutes, p. 60), (Letter 494).

**Submitted**—The following report on the 8.30 p.m. forecasts for February 1893 :—

**The letters used have the following signification :—**

**a = complete success.**

**b** = partial (i.e., more than half) success.

**c** = partial failure.

**d** = total failure.

FEBRUARY 1893.

| DISTRICTS.       |   | Per-centages. |          |                      | Per-centage<br>of Success.<br>a + b. |
|------------------|---|---------------|----------|----------------------|--------------------------------------|
|                  |   | Wind.         | Weather. | Average<br>Forecast. |                                      |
| SCOTLAND, N.     | a | 32            | 46       | 39                   | 80                                   |
| "                | b | 39            | 43       | 41                   |                                      |
| "                | c | 25            | 11       | 18                   |                                      |
| "                | d | 4             | 0        | 2                    |                                      |
| SCOTLAND, E.     | a | 18            | 46       | 32                   | 72                                   |
| "                | b | 50            | 29       | 40                   |                                      |
| "                | c | 25            | 21       | 23                   |                                      |
| "                | d | 7             | 4        | 5                    |                                      |
| ENGLAND, N.E.    | a | 29            | 39       | 34                   | 67                                   |
| "                | b | 36            | 29       | 33                   |                                      |
| "                | c | 21            | 28       | 24                   |                                      |
| "                | d | 14            | 4        | 9                    |                                      |
| ENGLAND, E.      | a | 14            | 50       | 32                   | 70                                   |
| "                | b | 50            | 25       | 38                   |                                      |
| "                | c | 32            | 18       | 25                   |                                      |
| "                | d | 4             | 7        | 5                    |                                      |
| MIDLAND COUNTIES | a | 25            | 39       | 32                   | 61                                   |
| "                | b | 29            | 29       | 29                   |                                      |
| "                | c | 32            | 28       | 30                   |                                      |
| "                | d | 14            | 4        | 9                    |                                      |
| ENGLAND, S.      | a | 29            | 57       | 43                   | 77                                   |
| "                | b | 46            | 22       | 34                   |                                      |
| "                | c | 21            | 21       | 21                   |                                      |
| "                | d | 4             | 0        | 2                    |                                      |
| SCOTLAND, W.     | a | 18            | 36       | 27                   | 68                                   |
| "                | b | 36            | 46       | 41                   |                                      |
| "                | c | 21            | 4        | 13                   |                                      |
| "                | d | 25            | 14       | 19                   |                                      |
| ENGLAND, N.W.    | a | 18            | 39       | 29                   | 70                                   |
| "                | b | 39            | 43       | 41                   |                                      |
| "                | c | 29            | 11       | 20                   |                                      |
| "                | d | 14            | 7        | 10                   |                                      |
| ENGLAND S.W.     | a | 25            | 61       | 43                   | 72                                   |
| "                | b | 32            | 25       | 29                   |                                      |
| "                | c | 36            | 4        | 20                   |                                      |
| "                | d | 7             | 10       | 8                    |                                      |
| IRELAND, N.      | a | 22            | 61       | 42                   | 72                                   |
| "                | b | 32            | 28       | 30                   |                                      |
| "                | c | 32            | 4        | 18                   |                                      |
| "                | d | 14            | 7        | 10                   |                                      |
| IRELAND, S.      | a | 29            | 54       | 42                   | 74                                   |
| "                | b | 32            | 32       | 32                   |                                      |
| "                | c | 11            | 4        | 7                    |                                      |
| "                | d | 28            | 10       | 19                   |                                      |
| SUMMARY.         |   |               |          |                      |                                      |
| BRITISH ISLES    | a | 24            | 48       | 36                   | 71                                   |
| "                | b | 38            | 32       | 35                   |                                      |
| "                | c | 26            | 14       | 20                   |                                      |
| "                | d | 12            | 6        | 9                    |                                      |

Read—A memorandum from Mr. Baillie stating that since last meeting five logs had been received, four of them being “excellent.”

Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

1. WARNINGS ISSUED.

|                    |   |   |   |   |                 |
|--------------------|---|---|---|---|-----------------|
| A + B (successful) | - | - | - | - | = 26 districts. |
| C (failures)       | - | - | - | - | = 10 districts. |

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
March 8, 1893.

Submitted—The following reports of work during the month of February 1893 :—

MARINE BRANCH.

March 8, 1893.

Examined 14 new logs and one lighthouse register.

Preparing specimen charts of various data for the month of February in the district between the Cape of Good Hope and New Zealand. Arranging generalized current arrows, drawing wind-roses, isobars, &c. for other months.

Charting currents in the Pacific Ocean. During the month nearly 4,500 current observations in this ocean were received from the Deutsche Seewarte.

Preparing monthly charts of sea temperature for a portion of the Atlantic westward of the British Isles for several years.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 28th February 1893.)

*Quarterly Weather Report*, 1881 :—

*Second Quarter*.—Nearly completed.

*Third Quarter*.—Tables and rough maps prepared.

*Weekly Weather Report*, 1893 :—

All numbers issued promptly to date.

Work for Appendices I. and II. well in hand.

*Weekly Weekly Report*, 1892 :—

Work on Monthly Summaries has now been resumed ; February is two-thirds done.

*Daily Weather Report*, 1893 :—

All numbers issued to date.

Monthly correction sheet for January issued.

*Primary Checking of Storm Warnings*, 1893.—Done to date, and returns handed in regularly.

*Checking of 8.30 p.m. Forecasts*.—Done to date.

*Plotting of Rainfall Stations (1881–90) on Maps*.—Preparation of lists of same, with careful notes, for Dr. Buchan, and of brief report for Council.—Completed.

Attendance in Divorce Court, for two days, giving evidence in cause of Drummond v. Drummond and Fox.—Done.

(Signed) FREDC. GASTER.

Telegraphic Branch,  
March 8, 1893.

PANTAGRAPH ROOM.

March 1, 1893.

*Hourly Means*.—The calculation of the various means for the year 1891 has been about one-third completed. The proof sheets of the volume for 1890 have come in rather slowly from the printer, but nearly three-fourths of them are now passed for press. The 1891 work has been temporarily stopped to allow the sunshine tabulations to be proceeded with.

*Tabulation of Sun Cards*.—The hourly measurements of the sunshine records for the seven observatories, for the 12 years 1881–1892, has been commenced. Some time was occupied at first in arranging the details of this work.

*Miscellaneous.*—A set of five large diagrams of harmonic curves was prepared to illustrate a paper read at the Royal Society.

A good deal of my time has been taken up with Mr. Dines's anemometer, which has been fitted up during the month.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.,  
Secretary.

#### EXAMINATION BRANCH.

March 1, 1893.

#### *Examinations.*

*September, 1892.*—Completed.

*October, 1892.*—Partially.

Weekly examination (on receipt) of curves and documents from all observatories.

#### *Reports.*

*August and September, 1892.*—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

#### *Miscellaneous.*

General routine work. I have been unwell with influenza and was absent six days, and Mr. Parsons has been absent throughout the month acting as Office-keeper.

(Signed) T. E. ALLEN.

Submitted the following statement of accounts :—

|                                                 | £     | s. | d. |
|-------------------------------------------------|-------|----|----|
| Cash balance on 21st February - - -             | 4,964 | 15 | 5  |
| Receipts from 22nd February to 7th March - -    | 35    | 5  | 9  |
|                                                 | 5,000 | 1  | 2  |
| Cheques drawn from 22nd February to 7th March - | 821   | 8  | 1  |
| Balance on 7th March - - -                      | 4,178 | 13 | 1  |

Submitted—The following list of publications which had been received since the last meeting :—

*London, Meteorological Office.*—Report of the Meteorological Council to the Royal Society, for the year ending 31st of March 1892.

*Manchester, Sheffield, and Lincolnshire Railway.*—Monthly statement of rain fallen in the year ending 31st December 1892.

*Leyst, E.*—Untersuchungen über die Bodentemperatur in Königsberg in Preussen.

*Rio de Janeiro, Observatorio.*—Annuario. 1892.

*Veeder, M. A.*—Thunderstorms.

— The relation between sun-spots and auroras.

*Fritzsche, H.*—Ueber die Bestimmung der geographischen Länge und Breite und der drei Elemente des Erdmagnetismus durch Beobachtung zu Lande sowie erdmagnetische und geographische Messungen an mehr als tausend verschiedenen Orten in Asien und Europa, ausgeführt in den Jahren 1867–91.

*Upton, W., and Rotch, A. L.*—Meteorological and other observations made in connection with the total solar eclipse of January 1, 1889, at Willows, California.

*Thomson, J.*—On the grand currents of atmospheric circulation.

*McLandsborough, J., and Paeston, A. E.*—Meteorology of Bradford for 1892.

*Broounof, P.*—Etude sur la couche de neige dans le Bassin du Dnièpre en Octobre, 1892.

*Chandler, A.*—Abstract of meteorological observations made at Torquay during the year 1892.

*Rotch, A. L.*—Observations made at the Blue Hill Meteorological Observatory, Mass., U.S.A., in the year 1891.

*Cruls, L.*—O clima do Rio de Janeiro.

*Prince, C. L.*—The summary of a meteorological journal kept at Crowborough Hill, Sussex, 1892.

*Lancaster, A.*—Le climat de la Belgique en 1892.